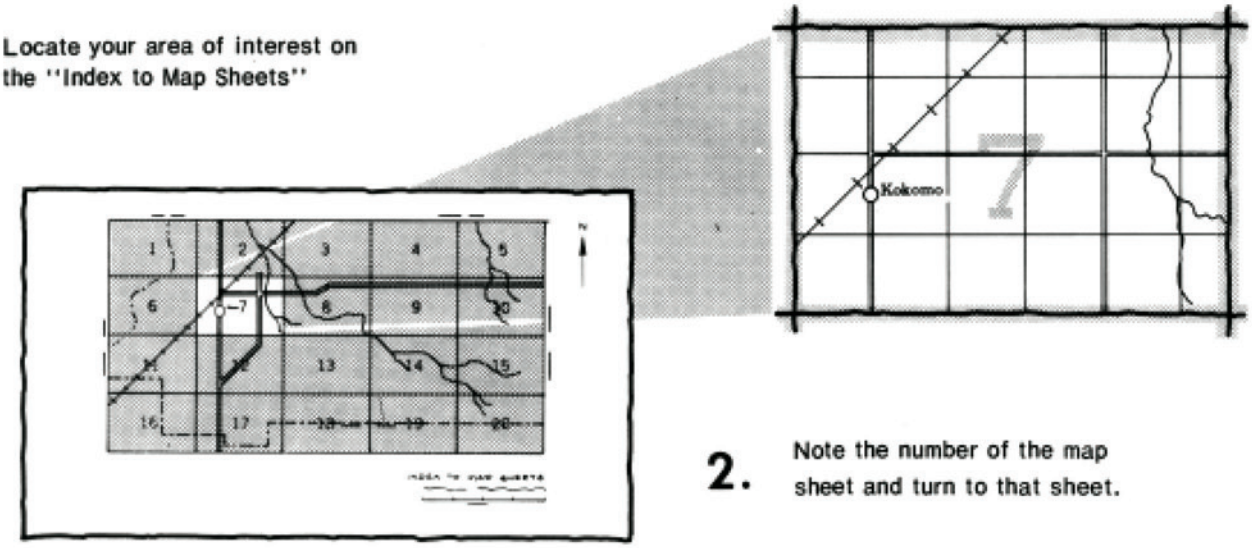
soil survey of
Hamilton County, Tennessee

United States Department of Agriculture
Soil Conservation Service
in cooperation with
Tennessee Agricultural Experiment Station

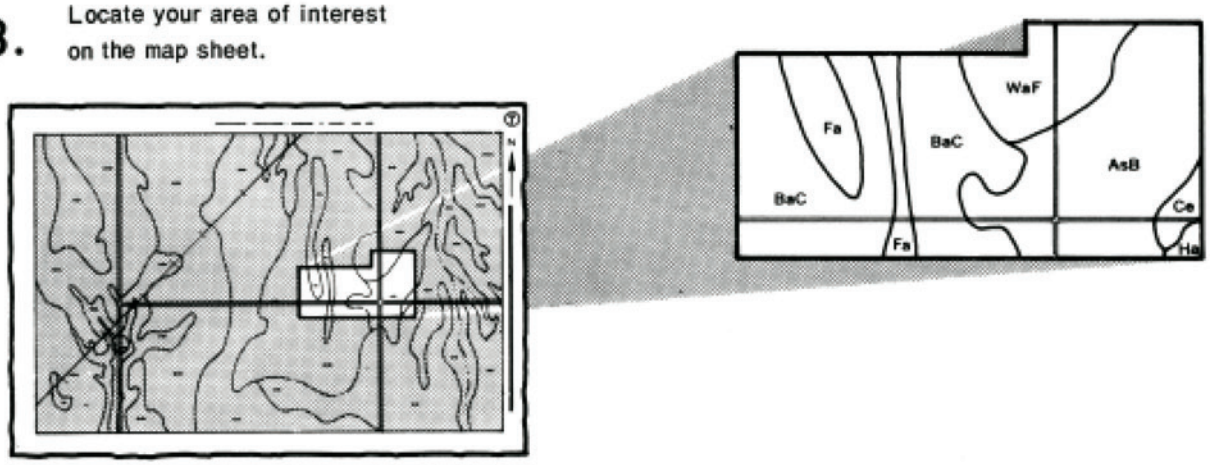
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets"

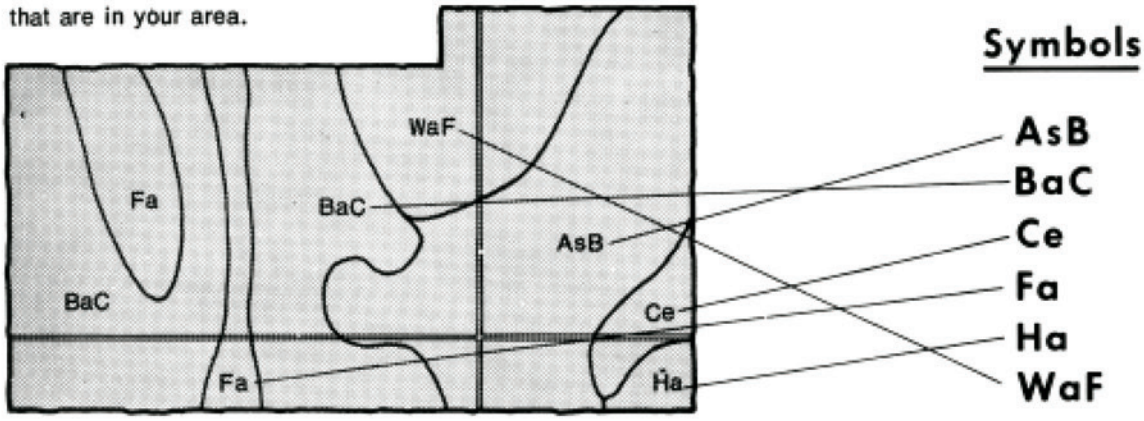


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

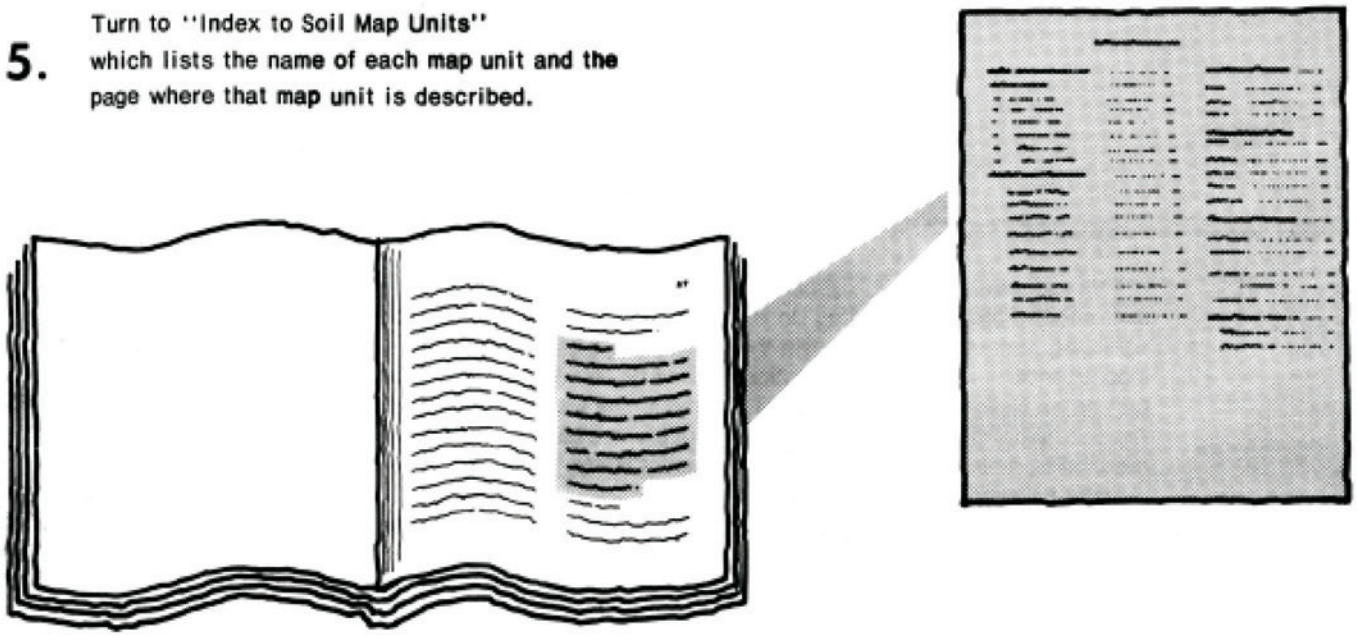


4. List the map unit symbols that are in your area.

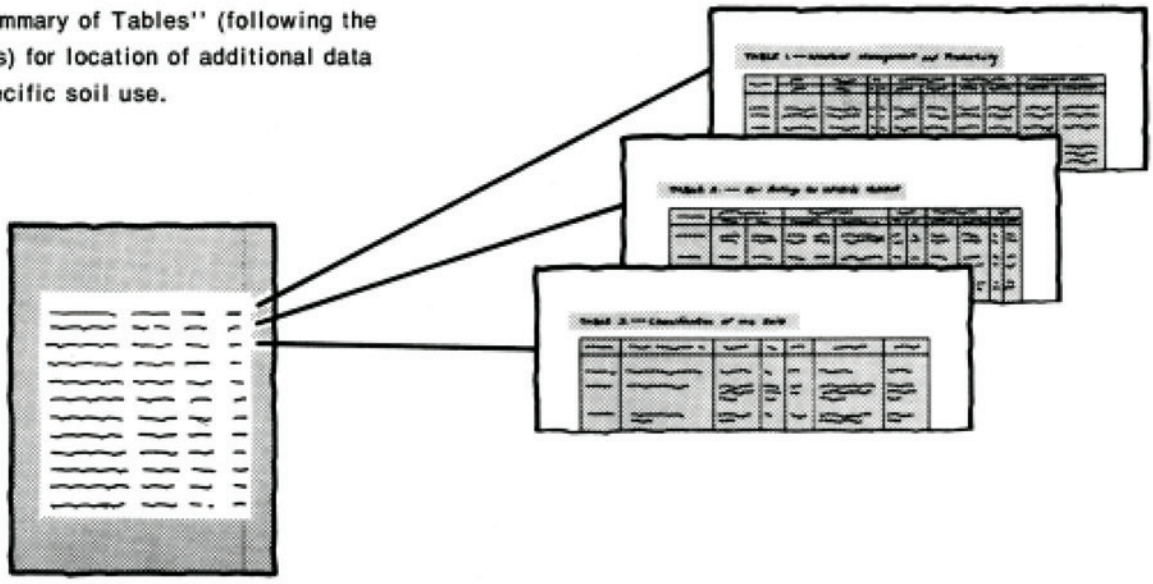


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was performed in the period 1972-78. Soil names and descriptions were approved in 1980. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1980. This survey was made cooperatively by the Soil Conservation Service and the Tennessee Agricultural Experiment Station. It is part of the technical assistance furnished to the Hamilton County Soil Conservation District.

The preparation of this survey was financed in part through Comprehensive Planning Assistance grant funds from the Department of Housing and Urban Development under the provision of Section 701 of the Housing Act of 1954, as amended, to the Chattanooga Area Regional Council of Governments/Southeast Tennessee Development District.

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soil series

Issued May 1982

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foreword

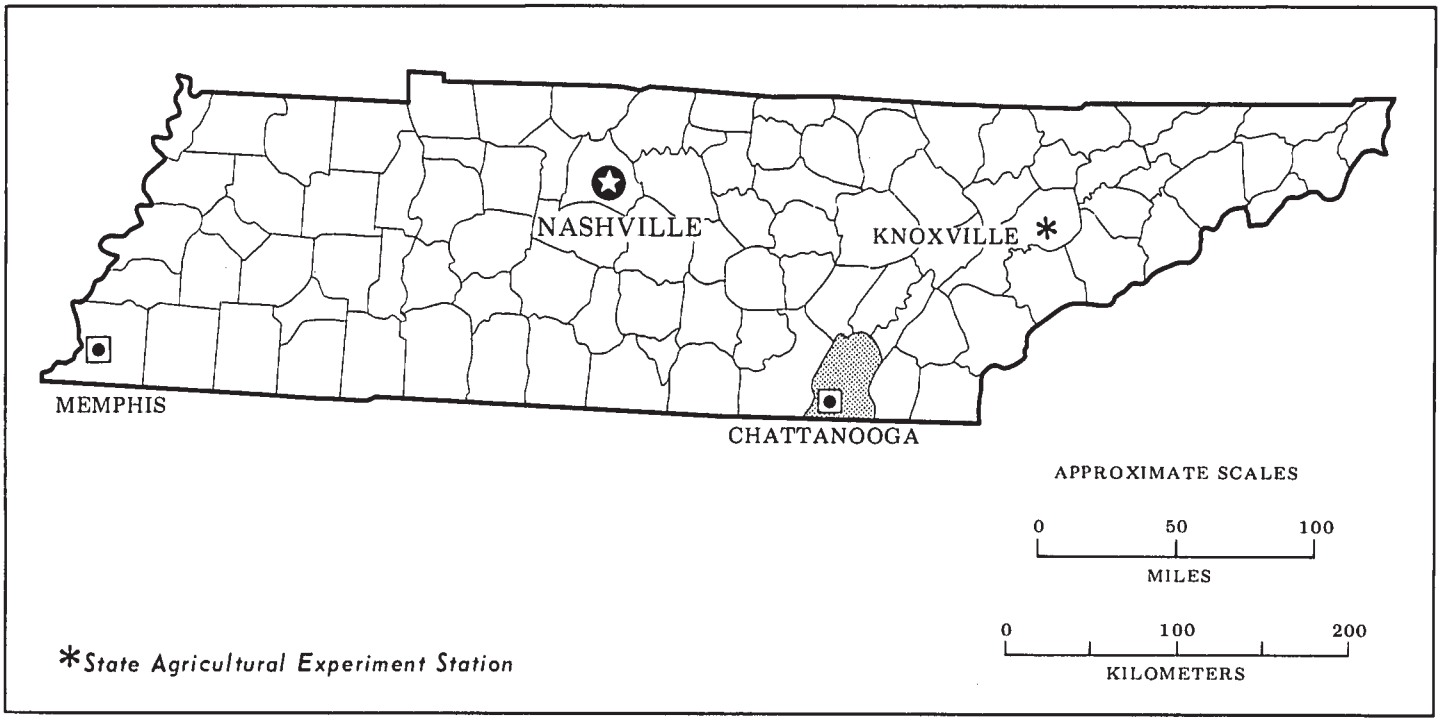
This soil survey contains information that can be used in land-planning programs in Hamilton County, Tennessee. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Donald C. Bivens
State Conservationist
Soil Conservation Service



Location of Hamilton County in Tennessee.

Soil survey of
Hamilton County, Tennessee

By Bedford W. Jackson, Soil Conservation Service

Soils surveyed by Bedford W. Jackson, Harry C. Davis, Hershel D. Dollar
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Soil Conservation Service
James I. Johnson, Hamilton County

United States Department of Agriculture, Soil Conservation Service
in cooperation with
Tennessee Agricultural Experiment Station

Hamilton County is in the southeastern part of Tennessee. It is bordered on the south by the Georgia State line, on the north by Bledsoe and Rhea Counties, on the west by Marion and Sequatchie Counties, and on the east by Meigs and Bradley Counties. Chattanooga, the county seat and principal city, is located in the southern part of the county, near the Georgia State line. Chattanooga is a leading center for manufacturing and transportation. In 1974, the population of the county was 264,700. The population is rapidly increasing.

The county is irregular in shape, measuring about 35 miles from north to south and 16 miles from east to west. It covers 587 square miles, or 375,680 acres. About 352,000 acres of this is land area and about 23,680 acres is water.

Hamilton County is divided from north to south by the Tennessee River and the Chickamauga and Nickajack Reservoirs.

Hamilton County is in two Major Land Resource Areas, the Cumberland Plateau and Mountains and the Southern Appalachian Ridges and Valleys. Soils in both of these areas formed under forest vegetation and are dominantly light in color. The soils in the Cumberland Plateau and Mountains are moderately deep over sandstone and shale bedrock. The soils in Southern Appalachian Ridges and Valley are moderately deep or deep over limestone and shale bedrock.

An older survey of Hamilton County was published in 1947 *(3)*. The present survey updates the earlier survey and provides additional information and larger maps that show the soils in greater detail.

general nature of the survey area

The history, industry, transportation, natural resources, and climate of the county are briefly described in this section.

history

The first known inhabitants of Hamilton County were the Cherokee and Chickamauga Indians. The first non-Indian traders in this area were Scotsmen, who made their homes among the Indians and married Indian women.

Hamilton County was formed from a part of Rhea County by an act of the General Assembly on October 25, 1819. It was named in honor of Alexander Hamilton. At that time, 821 non-Indians lived within its boundaries.

The population of Hamilton County is concentrated in or near Chattanooga. Several small towns in the county are within 35 miles of Chattanooga. Hamilton County does not have a large rural population that depends on farming for support.

About 22 percent of Hamilton County was in farms in 1969. In 1974, about 19 percent was in farms.

Industry

The industrial complex of Hamilton County is the largest in Southeast Tennessee. It includes marketing, merchandising, banking, housing, and chemical-based industries. Many large iron foundries are in Chattanooga.

More than 100 manufacturing firms operate in Hamilton County. They employ more than 50 percent of the nonagricultural workers. Many of the industrial workers are employed by a chemical company and an engineering company.

The housing industry has expanded greatly in recent years to keep pace with population growth. Residential areas have developed around downtown Chattanooga. Most of the residential units in the county are single-family houses. However, since 1970, a large number of multiple-family dwellings and high-rise apartments have been built. Prime farmland is being used very rapidly for urban development.

transportation

Interstate Highways 75 and 24 merge in Chattanooga. In addition to a freeway system, Hamilton County has an excellent network of state and local highways. Nearly all of the county roads are paved with bituminous materials.

Transportation by water is important to Chattanooga and Hamilton County. Barge tonnage of raw materials on the Tennessee River is increasing at a steady rate. Wood products, chemicals, coal, and oil products account for the largest tonnage.

Hamilton County is served by the Southern Railway and the Louisville and Nashville Railway. Major truck terminals are located in and near Chattanooga.

natural resources

Hamilton County has an abundant supply of timber, coal, and farmland. Tree production is a major enterprise on the slopes of the Cumberland Mountains and in areas of the valley not suited to the production of agricultural products.

Hamilton County has an abundant supply of fresh water. Streams that flow year-round are common. Water impounded behind the Nickajack Dam in Marion County on the Tennessee River backs up to Chattanooga. Water impounded behind the Chickamauga Dam, about 5 miles north of Chattanooga, backs up to the Watts Bar Dam in Rhea County.

climate

Prepared by the National Climatic Center, Asheville, North Carolina.

In winter, valleys in Hamilton County are very cool with occasional cold and warm spells. Upper slopes and mountaintops are generally cold. In summer, valleys are very warm and frequently hot, and mountains that are warm during the day become cool at night. Precipitation is heavy and evenly distributed throughout the year. Summer precipitation falls mainly during thunderstorms. In winter, precipitation in the valleys is mostly rain with occasional snow. Winter precipitation in the mountains is generally snow, although rains are frequent. Snow cover does not persist except at the highest elevations.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Chattanooga in the period 1951 to 1975. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 41 degrees F, and the average daily minimum temperature is 31 degrees. The lowest temperature on record, which occurred at Chattanooga on January 31, 1966, is -10 degrees. In summer the average temperature is 77 degrees, and the average daily maximum temperature is 88 degrees. The highest recorded temperature, which occurred at Chattanooga on July 28, 1952, is 106 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 52 inches. Of this, 24 inches, or 46 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 20 inches. The heaviest 1-day rainfall during the period of record was 4.68 inches at Chattanooga on March 16, 1973. Thunderstorms occur on about 55 days each year, and most occur in summer.

Average seasonal snowfall is 5 inches. The greatest snow depth at any one time during the period of record was 7 inches. On an average of 1 day, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 8 miles per hour, in March.

how this survey was made

Soil scientists made this survey to learn what soils are in the survey area, where they are, and how they can be used. They observed the steepness, length, and shape of slopes; the size of streams and the general pattern of drainage; the kinds of native plants or crops; and the kinds of rock. They dug many holes to study soil profiles.

A profile is the sequence of natural layers, or horizons, in a soil. It extends from the surface down into the parent material, which has been changed very little by leaching or by plant roots.

The soil scientists recorded the characteristics of the profiles they studied and compared those profiles with others in nearby counties and in more distant places. They classified and named the soils according to nationwide uniform procedures. They drew the boundaries of the soils on aerial photographs. These photographs show trees, buildings, fields, roads, and other details that help in drawing boundaries accurately. The soil maps at the back of this publication were prepared from aerial photographs.

The areas shown on a soil map are called map units. Most map units are made up of one kind of soil. Some are made up of two or more kinds. The map units in this survey area are described under "General soil map units" and "Detailed soil map units."

While a soil survey is in progress, samples of some soils are taken for laboratory measurements and for engineering tests. All soils are field tested to determine their characteristics. Interpretations of those characteristics may be modified during the survey. Data are assembled from other sources, such as test results, records, field experience, and state and local specialists. For example, data on crop yields under defined management are assembled from farm records and from field or plot experiments on the same kinds of soil.

But only part of a soil survey is done when the soils have been named, described, interpreted, and delineated on aerial photographs and when the laboratory data and other data have been assembled. The mass of detailed information then needs to be organized so that it can be used by farmers, woodland managers, engineers, planners, developers and builders, home buyers, and others.

general soil map units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

soil descriptions

1. Fullerton-Bodine

Gently sloping to steep, well drained and somewhat excessively drained cherty soils that are more than 5 feet deep over limestone; on high hills and ridges

The soils in this map unit are on high hills and ridges that have long, smooth slopes and narrow tops. Slopes range from 3 to 45 percent.

These soils make up about 48 percent of the county. About 38 percent of the unit is Fullerton soils, 21 percent is Bodine soils, and 41 percent is soils of minor extent.

Fullerton soils are well drained. They have a surface layer of dark grayish brown or brown cherty silt loam and a subsoil of red cherty clay.

Bodine soils are somewhat excessively drained. They have a surface layer of pale brown cherty silt loam and a subsoil of yellowish and brownish cherty or very cherty silty clay loam.

Of minor extent in this unit are the well drained Minvale soils on benches and foot slopes, the well drained Ennis soils along drainageways and in depressions, and the moderately well drained Roane soils along drainageways and on foot slopes and terraces.

About 40 percent of the acreage of this unit has been cleared. Most of the cleared areas on hillsides are used for pasture. Corn and hay crops are grown in the hollows, on the hilltops, and on the foot slopes. The uncleared acreage consists of rough, steep areas that are generally in mixed hardwoods.

The soils on hilltops and hillsides, which have been cleared, are suitable for pasture. Slope and the hazard of erosion are the main limitations. Overgrazing is a major concern of pasture management because it causes erosion. In most areas, ponds provide water for livestock. The soils are moderately permeable and cherty, and chemical treatment or compaction is required to make the ponds hold water.

The soils in this unit are moderately suited to trees, especially pines and mixed hardwoods. Productivity is medium. The steep slopes restrict the use of logging equipment, and erosion is a hazard along logging trails.

These soils are moderately to poorly suited to urban development. Slope is the main limitation.

2. Colbert-Talbott

Gently sloping to moderately steep, moderately well drained and well drained loamy soils that have a clayey subsoil and depth of 5 feet or less over limestone; on uplands

The soils in this map unit are on broad, gently sloping to moderately steep uplands. Slopes in the uplands are smooth and short. Most areas of this unit are drained by streams, and some areas are drained by underground caverns. Slopes range from 2 to 25 percent.

These soils make up about 10 percent of the county. About 40 percent of the unit is Colbert soils, 17 percent is Talbott soils, and 43 percent is soils of minor extent.

Colbert soils are moderately well drained. They have a surface layer of brown silt loam and a subsoil of yellowish brown clay that is mottled in shades of brown and gray. The depth to bedrock ranges from 40 to 60 inches.

Talbott soils are well drained. They have a surface layer of yellowish brown silt loam and a subsoil of yellowish red clay. The depth to bedrock ranges from 20 to 40 inches.

Of minor extent in this unit are the moderately well drained Capshaw and Tupelo soils on the stream terraces and the well drained Collegedale soils on the uplands.

About 75 percent of the acreage of this unit has been cleared. Most of the cleared areas are used for hay and

pasture. The uncleared acreage consists of moderately steep areas that are generally in mixed hardwoods or eastern redcedar.

These soils are moderately suited to hay and pasture. Slope, the hazard of erosion, and the clayey subsoil are the main limitations. Ponds provide water for livestock. The soils are slowly permeable and easily hold impounded water.

The soils in this unit are poorly suited to row crops. Most row crops produce low yields and growing them is not generally feasible. Erosion is a hazard if cultivated crops are grown.

In the wooded areas the soils are generally best suited to woodland use. Hardwoods are best suited. Chestnut and hickory are the trees most extensively grown. Productivity is low because the slowly permeable clayey subsoil retards the growth of roots and the movement of water and air through the soil.

These soils are poorly suited to sanitary facilities and building site developments. The slowly permeable clayey subsoil is the main limitation.

3. Lily-Lonewood-Ramsey

Gently sloping to steep, well drained loamy soils that are less than 6 feet deep over sandstone and shale; on the Cumberland Plateau

The soils in this map unit are on broad sloping uplands and the short and steep side slopes of long ridges. They are dissected by natural drainageways. Slopes range from 2 to 45 percent.

These soils make up about 12 percent of the county. About 40 percent of the unit is Lily soils, 11 percent is Lonewood soils, and 6 percent is Ramsey soils. The rest is soils of minor extent.

Lily soils are generally in broad areas that are dissected by shallow drainageways. They have a surface layer of dark grayish brown and pale brown loam and a subsoil of yellowish brown clay loam. The depth to bedrock ranges from 20 to 40 inches.

Lonewood soils are on broad, smooth plateaus. They have a very dark grayish brown silt loam surface layer and a subsoil that is yellowish brown silt loam in the upper part and yellowish red silty clay loam in the lower part. The depth to bedrock ranges from 40 to 72 inches.

Ramsey soils are on the side slopes of ridges and drains. They have a very dark grayish brown and brown loam surface layer and a subsoil of yellowish brown loam. The depth to sandstone bedrock is less than 20 inches.

Of minor extent in this unit are the well drained Sequoia and Gilpin soils on the shale ridges and the Crossville soils on sandstone uplands.

About 5 percent of the acreage of this unit has been cleared. Most of the cleared areas are used for cultivated crops, hay, and pasture. The uncleared acreage is in mixed hardwoods or pine. Part of the uncleared acreage consists of rough, steep areas that are generally in hardwoods.

The gently sloping and sloping soils, which have been cleared, are well suited to pasture and fairly well suited to cultivated crops. Hay and pasture crops are grown extensively. A small acreage is in cultivated crops.

Erosion is a hazard if cultivated crops are grown. Ponds must be constructed to provide water for livestock, because no permanent streams flow through the area. Pond reservoir areas and embankments must be well compacted during construction to prevent seepage.

The soils in this unit are moderately suited to trees. Mixed oak and hickory are predominant on the smooth uplands. Pine is predominant on the southern exposures. Productivity is medium. There are no limitations to woodland management.

These soils are moderately suited to urban use. Depth to rock is a limitation. Placement of septic tank absorption fields is restricted by the depth to sandstone or shale.

4. Bouldin-Gilpin-Allen

Gently sloping to steep, well drained loamy soils that range from 2 feet to more than 5 feet deep over sandstone, shale, and limestone; on mountainsides and foot slopes

The soils in this map unit are on gently sloping to steep foot slopes and long, steep mountainsides dissected by steep, deep drainageways. Slopes range from 3 to 60 percent.

These soils make up about 15 percent of the county. About 25 percent of the unit is Bouldin soils, 25 percent is Gilpin soils, and 15 percent is Allen soils. The rest is soils of minor extent.

Bouldin soils generally are on the concave areas immediately below sandstone escarpments and on the side slopes of the drainageways. They have a surface layer of brown stony loam and a subsoil of strong brown and yellowish red stony clay loam. The depth to bedrock is greater than 6 feet.

Gilpin soils are generally on the convex areas of the mountainside. They have a surface layer of dark grayish brown and yellowish brown silt loam and a subsoil of strong brown shaly silt loam. The depth to bedrock ranges from 20 to 40 inches.

Allen soils are on foot slopes at the base of mountains. They have a surface of brown loam and a subsoil of yellowish red and red clay loam. The depth to bedrock is more than 5 feet.

Of minor extent in this unit are the well drained Ramsey and Sequoia soils on convex areas.

About 1 percent of the acreage of this unit has been cleared. Most of the cleared areas are on hillsides and are being used for pasture and garden crops. The uncleared acreage consists of rough, steep areas that

are generally in mixed hardwoods. Pines are dominant in cutover or burned areas.

These soils are best suited to woodland. The soils on foot slopes are well suited to pasture and fairly well suited to crops. No natural streams flow through the area, and constructing ponds to supply water for livestock is difficult.

The soils in this unit are moderately suited to trees. The woodland is predominantly mixed hardwoods or pines. Productivity is medium or low. The steep slopes and stoniness restrict the use of logging equipment, and erosion is a hazard along logging roads.

These soils are poorly suited to sanitary facilities and building site developments. Slope, slippage, and stones are limitations.

5. Montevallo-Hanceville

Moderately steep and steep, well drained loamy soils that range from less than 20 inches to more than 5 feet deep over sandstone and shale; on mountains and ridges

The soils in this map unit are on high mountains and adjacent ridges. The mountain slopes are long, smooth, and dissected by shallow drainageways. The ridges are steep and have smooth slopes dissected by deep drainageways. Slopes range from 12 to 45 percent.

These soils make up about 2 percent of the county. About 60 percent of the unit is Montevallo soils and 15 percent is Hanceville soils. The rest is soils of minor extent.

Montevallo soils generally are on the western slopes of White Oak Mountain and on the ridges. They have a surface layer of dark grayish brown shaly silt loam and a subsoil of light yellowish brown very shaly silt loam. The depth to weathered shale bedrock is less than 20 inches.

Hanceville soils generally are on the top and eastern exposure of White Oak Mountain. They have a surface layer of reddish brown loam and a subsoil of dark red clay and clay loam.

Of minor extent in this unit are the well drained Armuchee soils on the steep slopes and the well drained Enders soils on the benches and smoother slopes.

Less than 1 percent of the acreage of this unit has been cleared. The uncleared acreage consists of steep, rough areas that are generally in mixed hardwoods or pine.

The soils in this unit are suited to trees. On the western and southern exposures the woodland is predominantly pine, and on the northern and eastern exposures mixed hardwoods predominate. Productivity is medium to low. The steep slopes restrict the use of logging equipment and erosion is a hazard along logging trails.

These soils are poorly suited to crops, pasture, sanitary facilities, and building site developments. Slope and depth to rock are limitations.

6. Armuchee-Enders-Apison

Gently sloping to steep, well drained loamy soils that have a clayey and loamy subsoil and are less than 5 feet deep to shale bedrock; on rolling hills and ridges

The soils in this map unit are on broad, sloping uplands and high ridges. The ridges generally are uniform in elevation and have long, smooth side slopes dissected by deep, narrow drainageways. Slopes range from 2 to 45 percent.

The soils in this map unit make up about 8 percent of the county. About 30 percent of the unit is Armuchee soils, 30 percent is Enders soils, and 7 percent is Apison soils. The rest is soils of minor extent.

Armuchee soils generally are on the side slopes of ridges. They have a surface layer of brown silt loam and a subsoil of strong brown shaly silty clay. The depth to weathered shale bedrock ranges from 20 to 36 inches.

Enders soils generally are on the smooth uplands. They have a brown silt loam surface layer and a subsoil of yellowish red silty clay and clay. The depth to weathered shale bedrock ranges from 40 to 60 inches.

The Apison soils generally are on broad, smooth uplands. They have a surface layer of brown loam and a subsoil of yellowish brown clay loam. The depth to weathered shale bedrock ranges from 20 to 40 inches.

Of minor extent in this unit are the well drained Montevallo soils on the steep ridges and the Nesbitt soils on foot slopes.

About 60 percent of the acreage of this unit has been cleared. Most of the cleared areas are used for hay and pasture. Corn and garden crops are grown at the base of slopes. The uncleared acreage consists of rough, steep areas that are generally in mixed hardwoods and pine.

The soils on the steep areas, which have been cleared, are moderately suited to grasses and pasture. Soils on the smooth areas are moderately suited to some cultivated crops, hay, and pasture. Small streams and ponds provide water for livestock.

The soils in this unit are moderately suited to trees. They are best suited to pines. Productivity is medium. The steep slopes of the ridges restrict the use of logging equipment, and erosion is a hazard along logging trails.

These soils are poorly suited to sanitary facilities. Slope and either the clayey subsoil or the depth to shale bedrock, or both, are limitations.

7. Ramsey-Rock outcrop-Lily

Gently sloping to steep, well drained loamy soils that are less than 4 feet deep over sandstone bedrock and Rock outcrop; on the Cumberland Plateau

The soils in this map unit are on broad, sloping uplands and steep side slopes that are dissected by

drainageways. Slopes are commonly short and smooth. Slopes range from 2 to 45 percent.

These soils make up about 5 percent of the county. About 50 percent of the unit is Ramsey soils, 25 percent is sandstone Rock outcrop, and 10 percent is Lily soils. The rest is soils of minor extent.

Ramsey soils generally are on the side slopes of ridges, along drainageways, and in areas near outcrops of sandstone. They have a surface layer of very dark grayish brown and brown loam and a subsoil of yellowish brown loam and sandy loam. The depth to bedrock is less than 20 inches.

Areas of Rock outcrop generally are on the side slopes of ridges and near the tops of slopes parallel to drainageways, but Rock outcrop can occur in any position. Generally, it is associated with the Ramsey soils.

Lily soils are mostly on the broad, smooth uplands. They have a surface layer of dark grayish brown and pale brown loam and a subsoil of yellowish brown loam, clay loam, and sandy clay loam. The depth to bedrock ranges from 20 to 40 inches.

Of minor extent in this unit are the well drained Crossville, Gilpin, and Sequoia soils.

About 1 percent or less of the acreage of this unit has been cleared. Most of the cleared areas are used for pasture or garden crops. The uncleared acreage consists mostly of rough, steep areas that are generally in mixed hardwoods. Pine is predominant in areas where extensive logging operations have been conducted.

These soils are not suited to cultivated crops except in small isolated areas. The soils and Rock outcrop are so intermingled that cultivation is difficult. The gently sloping and sloping soils are well suited to pasture.

The soils in this map unit are best suited to trees. Productivity is low. The steep slopes and Rock outcrop restrict the use of logging equipment, and erosion is a hazard along logging trails.

These soils are poorly suited to sanitary facilities and building site developments. Slope, depth to bedrock, and rockiness are limitations.

detailed soil map units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and management of the soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Allen loam, 3 to 12 percent slopes, is one of several phases in the Allen series.

Some map units are made up of two or more major soils. These map units are called soil complexes.

A *soil complex* consists of two or more soils in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Bodine-Shack complex is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Urban land is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

soil descriptions

AeC—Allen loam, 3 to 12 percent slopes. This deep, well drained, gently sloping and sloping soil is on the foot slopes of mountains. Areas are irregular in shape and are dissected by numerous drainageways. On short slopes adjacent to the drainageways, the soil is steeper, but these areas are too small to map separately. Slopes range from 3 to 12 percent but are dominantly 6 to 12 percent. Individual areas range from 3 to 50 acres.

Typically, the surface layer is brown loam about 7 inches thick. The upper few inches of the subsoil is yellowish brown loam, and the remainder is yellowish red and red clay loam that extends to a depth of 74 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by roots.

Included with this soil in mapping are small areas of Bouldin soils that have more than 35 percent by volume fragments of sandstone in the surface layer and subsoil.

This soil is used for crops, hay, pasture, and woodland.

This soil is moderately suited to cultivated crops and well suited to hay and pasture. It is well suited to perennial hay and pasture grasses. Erosion is a hazard if row crops are grown.

This soil is well suited to use as woodland. Trees that grow on this soil include yellow-poplar, shortleaf pine,

and Virginia pine. There are no significant limitations to woodland use and management.

This soil is well suited to most urban uses. It has no significant limitations which cannot be overcome by normal design and construction procedures.

This soil is in capability subclass IIIe and woodland subclass 3o.

AeD—Allen loam, 12 to 25 percent slopes. This deep, well drained, moderately steep and steep soil is on foot slopes of the Cumberland, White Oak, and Grindstone Mountains. Individual areas range from 2 to 20 acres.

Typically, the surface layer is dark grayish brown loam about 2 inches thick. The subsurface layer is pale brown loam about 5 inches thick. The subsoil is yellowish brown loam in the upper few inches; and below that, to a depth of 74 inches, it is yellowish red or red clay loam.

Included with this soil in mapping are small areas of Bouldin soils that have more than 35 percent by volume fragments of sandstone in the surface layer and subsoil. Also included are some small, severely eroded areas that have a surface layer of yellowish red clay loam.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by roots.

This soil is used for woodland and pasture.

This soil is poorly suited to cultivated crops and moderately suited to pasture crops. Its best use is for growing perennial hay and pasture grasses. Slope limits the use of equipment.

This soil is well suited to use as woodland. Productivity is only moderate because of low fertility, but there are no significant management problems. Trees which grow on this soil include Virginia pine, shortleaf pine, and loblolly pine.

This soil is poorly suited to most urban uses. Slope is a severe limitation that is difficult to overcome. Slippage is a hazard if extensive excavations are made.

This soil is in capability subclass IVe and woodland subclass 3o.

AeE—Allen loam, 25 to 40 percent slopes. This deep, well drained, steep soil is on the foot slopes of the Cumberland, Grindstone, and White Oak Mountains. Slopes are generally broad and long. Individual areas range from 2 to 40 acres.

Typically, the surface layer is dark grayish brown and pale brown loam about 7 inches thick. The subsoil is yellowish brown loam in the upper few inches; and below that, to a depth of 74 inches, it is yellowish red or red clay loam.

Included with this soil in mapping are small areas of Bouldin soils that have more than 35 percent by volume fragments of sandstone in the surface layer and subsoil.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid. Permeability is moderate, and the available water capacity is high. The root zone is deep and easily penetrated by roots.

This soil is in woodland.

This soil is poorly suited to farming. Slope, the hazard of erosion, and a high rate of runoff are severe limitations to the use of this soil as cropland.

This soil is moderately suited to use as woodland. Slope and the hazard of erosion limit the use of equipment. Trees that grow on this soil are Virginia pine, shortleaf pine, and loblolly pine.

This soil is poorly suited to most urban uses. Slope and the hazard of slippage are severe limitations that are difficult to overcome.

This soil is in capability subclass VIIe and woodland subclass 3r.

ApC—Apison loam, 5 to 15 percent slopes. This moderately deep, well drained, gently rolling and rolling soil is on convex ridgetops, knolls, and short, uneven side slopes. Individual areas of this soil range from 5 to 50 acres.

Typically, the surface layer is brown loam about 7 inches thick. The subsoil is yellowish brown clay loam. Soft interlayered shale and siltstone bedrock is at a depth of 28 inches. The bedrock can be dug with a spade but cannot be penetrated by roots, except in cracks and crevices.

Included with this soil in mapping are numerous small areas of a similar soil that has a reddish brown surface layer and a reddish brown or red subsoil. The red color of this soil is derived from the reddish colored shale rock from which it formed. This included soil has the same suitability for use as the Apison soil. Included in mapping are a few areas which have less than 5 percent slopes and small areas of a soil which has a clayey subsoil.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has recently been limed. Permeability is moderate, and the available water capacity is moderate. This soil is easily tilled, but the root zone is only moderately deep over weathered shale bedrock.

About 40 to 50 percent of the acreage of this soil is used as woodland. The remainder is used mostly for hay and pasture, but a few areas are used for row crops.

This soil is well suited to hay and pasture and moderately suited to row crops. The suitability of this soil for row crops is limited by a moderately deep root zone and short, uneven slopes. Erosion is a moderate to severe hazard when cultivated crops are grown.

This soil is moderately suited to use as woodland. Trees which grow on this soil include loblolly pine, shortleaf pine, Virginia pine, and northern red oak. Low fertility and moderate available water capacity limit productivity. This soil has no significant limitations to woodland management.

This soil is moderately suited to building sites, roads, and most other engineering uses. Slope and depth to shale bedrock are the major limitations to these uses. The use of this soil as septic tank absorption fields is severely limited by the moderate depth to bedrock.

This soil is in capability subclass IIIe and woodland subclass 3o.

ArB—Arents, gently sloping. This map unit consists of soils that have been moved or deeply mixed by machinery. Most of this unit is a result of cutting and filling to shape the land surface. Slopes are dominantly 2 to 6 percent, but range from 2 to 12 percent. Most areas of Arents are near the suburbs of cities, interstate highways, and shopping center complexes.

Interpretative groupings were not assigned because the unit is variable. Onsite investigations are needed to determine the suitability of individual areas for specific uses.

AuD—Armuchee silt loam, 10 to 25 percent slopes. This moderately deep, well drained, sloping and moderately steep soil is on shale ridges. Slopes are short and commonly range from 15 to 20 percent but may range from 10 to 25 percent. Individual areas range from 10 to 50 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is strong brown shaly silty clay loam and shaly silty clay that extends to a depth of 17 inches. The underlying material is strong brown very shaly silty clay. Soft shale bedrock is at a depth of about 24 inches.

The soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is low. The root zone is shallow.

Included with this soil in mapping are areas of soils which have a clayey subsoil that does not contain fragments of shale and areas of soils that have more than 35 percent by volume fragments of shale in the subsoil. Also included are small, severely eroded areas where the surface layer is shaly silty clay loam.

This soil is used mainly for woodland, although in a few areas it is used for pasture.

This soil is poorly suited to cultivated crops and pasture. A shallow root zone, low fertility, and low available water capacity limit the use of this soil as pasture or cropland. Erosion is a severe hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland, although woodland is generally the best use of this soil. Productivity is low for both pine and hardwoods. A shallow root zone, low available water capacity, and low fertility are limitations. Trees that grow on this soil are shortleaf pine, Virginia pine, and southern red oak.

This soil is poorly suited to most urban uses because of moderate depth to rock, slow permeability, low strength for supporting local roads and streets, and slope.

This soil is in capability subclass VIe and woodland subclass 4d.

AuE—Armuchee silt loam, 25 to 40 percent slopes. This moderately deep, well drained, steep soil is on shale ridges. Slopes are commonly short and dissected by drainageways. Individual areas range from 5 to 50 acres.

Typically, the surface layer is brown silt loam about 8 inches thick. The subsoil is strong brown shaly silty clay loam and shaly silty clay about 9 inches thick. The underlying material is strong brown very shaly silty clay that extends to soft shale bedrock at about 24 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is low. The root zone is shallow.

Included with this soil in mapping are areas of soils which have a clayey subsoil that does not contain fragments of shale and areas of soils that have more than 35 percent by volume fragments of shale.

This soil is used mainly for woodland. It is poorly suited to use as woodland. Slope limits the use of machinery and equipment. A shallow root zone, low available water capacity, and low fertility are other limitations. Trees which grow on this soil include shortleaf pine, Virginia pine, and southern red oak.

This soil is poorly suited to cultivated crops, hay, and pasture. Limitations to these uses are a shallow root zone, low available water capacity, slope, and the hazard of erosion.

This soil is poorly suited to most urban uses because of slope, moderate depth to rock, and moderately slow permeability.

This soil is in capability subclass VIIe and woodland subclass 4d.

BaE—Barfield-Rock outcrop complex, 10 to 40 percent slopes. This map unit consists of small areas of moderately steep and steep Barfield soils and limestone Rock outcrop so intermingled that they could not be separated at the scale selected for mapping. Areas of this map unit range from about 5 to 50 acres in size, and individual areas of each component range from 0.1 acre to about 2 acres. Barfield soils make up from 35 to 70 percent of each mapped area, averaging about 45

percent, and Rock outcrop makes up from 30 to 65 percent of each mapped area, also averaging about 45 percent.

Barfield soils are shallow and well drained. Typically, the surface layer is very dark grayish brown silty clay loam about 5 inches thick. The subsoil is very dark grayish brown silty clay in the upper part and light olive brown silty clay in the lower part. Hard limestone bedrock is at a depth of 16 inches.

Barfield soils are medium in natural fertility and organic matter content. They range from neutral to mildly alkaline. Permeability is moderately slow, and the available water capacity is low or very low. The shrink-swell potential is high.

Rock outcrop is limestone bedrock that is exposed on the land surface. In most places, the rocks extend from 1 foot to 3 feet above the surface.

Included with this unit in mapping are small areas of a soil that is deeper than 20 inches to bedrock and areas where the surface layer is silt loam.

The soils in this map unit are used for woodland. They are poorly suited to farming, woodland, and engineering and urban uses. Rock outcrops, shallowness to bedrock, steepness of slope, and low available water capacity are all severe limitations that are difficult to overcome. Eastern redcedar is the only tree species recommended for planting.

This complex is in capability subclass VIIs. The Barfield soils are in woodland subclass 4d.

BoC—Bodine cherty silt loam, 5 to 12 percent slopes. This deep, somewhat excessively drained, sloping soil formed in cherty residuum of limestone. Slopes are smooth and convex. Individual areas range from 5 to 100 acres.

Typically, the surface layer is pale brown cherty silt loam 6 inches thick. The subsoil extends to a depth of 65 inches or more. It is brownish yellow cherty silty clay loam in the upper part and yellowish brown and strong brown very cherty silty clay loam in the middle and lower parts.

This soil is low in natural fertility and organic matter content. It is very strongly acid or strongly acid. Permeability is moderately rapid, and the available water capacity is moderate. Tilth is fair and the root zone is deep.

Included with this soil in mapping are small areas of soils that have a reddish clayey subsoil containing less than 35 percent fragments of chert.

This soil is used for woodland, hay, and pasture.

This soil is moderately suited to farming. The major limitations are fragments of chert, which interfere with tillage, and droughtiness. This soil is best suited to crops that have their maximum growth in the fall and spring.

This soil is moderately suited to use as woodland. Suitability for this use is limited by the fragments of chert, droughtiness, and seedling mortality. Trees that grow on this soil include shortleaf pine, Virginia pine, and black oak.

This soil is well suited to most urban uses. The fragments of chert limit some uses, such as establishing grass on lawns.

This soil is in capability subclass IVs and woodland subclass 4f.

BoD—Bodine cherty silt loam, 12 to 25 percent slopes. This deep, somewhat excessively drained, moderately steep to steep soil is on side slopes of limestone ridges. Slopes are smooth and convex. Individual areas range from 20 to 150 acres.

Typically, the surface layer is dark grayish brown and pale brown cherty silt loam 6 inches thick. The subsoil extends to a depth of 65 inches or more. It is brownish yellow cherty silty clay loam in the upper part and yellowish brown and strong brown very cherty silty clay loam in the middle and lower parts.

This soil is very strongly acid or strongly acid. It is low in natural fertility and organic matter content. Permeability is moderately rapid, and the available water capacity is moderate. Tilth is fair, and the root zone is deep.

Included with this soil in mapping are small areas of Fullerton soils on side slopes and ridgetops. Fullerton soils have a reddish clayey subsoil which contains less than 35 percent by volume fragments of chert. Also included are small areas of Minvale soils on the lower side slopes and benches. Minvale soils have a redder hue throughout and less than 35 percent by volume fragments of chert.

This soil is used mostly for woodland and pasture.

This soil is moderately suited to use as woodland. Droughtiness, low fertility, and the large volume of chert fragments are the most limiting soil features. Low productivity and seedling mortality are the most severe management problems. Trees that grow on this soil include Virginia pine, eastern redcedar, and chestnut oak.

This soil is poorly suited to row crops and only moderately suited to hay and pasture. Droughtiness, a large volume of chert fragments, and slope are limiting soil features. Cool-season grasses and legumes that have their maximum growth in the spring and fall grow best on this soil.

This soil is poorly to moderately suited to most urban uses. Slope and the large volume of chert fragments severely limit many urban uses.

This soil is in capability subclass VIs and woodland subclass 4f.

BoE—Bodine cherty silt loam, 25 to 45 percent slopes. This deep, somewhat excessively drained, steep cherty soil is on the side slopes of ridges in the limestone valleys. It formed in residuum of limestone.

Slopes are smooth and convex. Individual areas range from 2 to 100 acres.

Typically, the surface layer is dark grayish brown and pale brown cherty silt loam 6 inches thick. The subsoil extends to a depth of 65 inches or more. It is brownish yellow cherty silty clay loam in the upper part and yellowish brown and strong brown very cherty silty clay loam in the middle and lower parts.

This soil is very strongly acid or strongly acid. It is low in natural fertility and organic matter content. Permeability is moderately rapid, and the available water capacity is moderate. Tilth is fair, and the root zone is deep.

Included with this soil in mapping are small areas of Fullerton soil on side slopes and ridgetops. Fullerton soils have a reddish clayey subsoil which contains less than 35 percent by volume fragments of chert. Also included are small areas of Minvale soil on the lower side slopes and benches. Minvale soils have a redder hue and less than 35 percent fragments of chert throughout the soil.

This soil is poorly suited to farming. Its suitability is limited by slope, fragments of chert, and droughtiness. Cool season perennial grasses and legumes grow best on this soil.

This soil is moderately suited to use as woodland. Fragments of chert, seedling mortality, droughtiness, and slope are major limitations. Slope severely limits the use of machinery and equipment. Trees that grow on this soil include loblolly pine, Virginia pine, and eastern redcedar.

This soil is poorly suited to urban uses. Slope is a limitation to the use of this soil as septic tank absorption fields.

This soil is in capability subclass VIIs and woodland subclass 4f.

BsD—Bodine-Shack complex, 5 to 25 percent slopes. This map unit consists of areas of sloping to moderately steep Bodine and Shack soils so intermingled that it was not practical to separate them in mapping. Bodine soils are on the narrow ridgetops and the steeper part of the side slopes. They are deep, somewhat excessively drained, cherty or very cherty soils. Shack soils are on the broadest ridgetops, in concave areas at the head of drainageways, and on toe slopes. The Shack soils are deep, moderately well drained, cherty soils that have a compact, slowly permeable layer in the subsoil. Bodine soils make up 55 to 75 percent and Shack soils 20 to 45 percent of each mapped area.

Typically, the Bodine soils have a pale brown cherty silt loam surface layer about 6 inches thick. The subsoil extends to a depth of 65 inches or more. It is brownish yellow cherty silty clay loam in the upper part and yellowish brown and strong brown very cherty silty clay loam in the middle and lower parts.

Bodine soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid. Permeability is moderately rapid, and the available water capacity is low. Tilth is only fair because of the cherty surface layer. The root zone is deep.

Typically, the Shack soils have a grayish brown and light yellowish brown cherty silt loam surface layer about 5 inches thick. The subsoil is yellowish brown cherty silty clay loam in the upper part. In the middle part it is strong brown, mottled cherty silty clay loam that is slowly permeable; and in the lower part it is yellowish red cherty silty clay loam.

Shack soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid. Permeability is moderate in the surface layer and upper part of the subsoil and moderately slow in the middle part of the subsoil. The available water capacity is moderate. The root zone is moderately deep over the compacted layer in the subsoil.

Included in mapping are some small areas of Fullerton soils which have a cherty, clayey subsoil.

The soils in this map unit are used mostly for woodland and pasture.

These soils are poorly suited to cropland and moderately suited to pasture. Droughtiness, slope, and the large volume of chert fragments are the major limitations to these uses. Cool-season perennial grasses and legumes grow best on these soils.

These soils are moderately suited to use as woodland. Droughtiness and low fertility are limitations that affect seedling mortality and tree growth. Trees that grow on this soil include Virginia pine, loblolly pine, shortleaf pine, and chestnut oak.

These soils are moderately suited to most urban uses. Some areas of this unit are being developed for residential use. Slope, the large volume of chert fragments, and the moderately slow permeability of the Shack soils are limiting features. The Shack soils are severely limited for use as septic tank absorption fields because of slow permeability in the subsoil.

These soils are in capability subclass VIs. Bodine soils are in woodland subclass 4f, and Shack soils are in woodland subclass 3r.

BuF—Bouldin-Gilpin complex, 20 to 60 percent slopes. This map unit consists of areas of deep, well drained stony Bouldin soils and moderately deep, well drained Gilpin soils that are so intermingled that it was not practical to separate them in mapping. The soils in this map unit are on steep side slopes of the Cumberland Mountains which are truncated by a network of drainageways across the slopes. Bouldin soils are in the drainageways and on concave slopes adjacent to the drainageways. They are also on benches and fans. Gilpin soils are on convex ridgetops and upper side slopes between the drainageways. Individual areas of each soil are irregular in shape and range from about 2

to 15 acres in size. Bouldin soils make up 45 to 75 percent of each mapped area, and Gilpin soils make up 15 to 35 percent.

Typically, the Bouldin soils have a surface layer of very dark grayish brown and brown stony loam about 7 inches thick. The subsoil extends to a depth of 80 inches or more. It is strong brown stony loam in the upper part and yellowish red stony loam in the middle and lower parts. Rock fragments make up about 25 percent of the surface layer and 40 to 65 percent of the subsoil. The fragments are dominantly 6 to 24 inches across but range from about 3 inches to several feet across.

Bouldin soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid. Permeability is moderate. The root zone is deep, but the available water capacity is only moderate because of the large number of rock fragments in the soil.

Typically, the Gilpin soils have a surface layer of dark grayish brown and yellowish brown silt loam about 8 inches thick. The subsoil extends to a depth of 24 inches and is strong brown shaly silt loam. The underlying material is yellowish brown shaly silt loam. Rippable shale bedrock is at a depth of 30 inches.

Gilpin soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid. These soils have a moderately deep, moderately permeable root zone. The available water capacity is moderate.

Included in mapping are areas of Allen and Sequoia soils, which make up 10 to 20 percent of this unit. Allen soils are mostly at the base of the slopes. They are deep and loamy and contain few rock fragments. Sequoia soils are on the convex ridgetops and points of ridges. They have a clayey subsoil and are moderately deep to shale bedrock.

Practically all of the acreage of this map unit is used as woodland.

These soils are poorly suited to farming. Steep slopes, the severe hazard of erosion when these soils are cleared, and the large number of stones on the Bouldin soils are limitations.

These soils are moderately suited to use as woodland. Trees which grow on these soils include yellow-poplar, northern red oak, white oak, eastern white pine, shortleaf pine, and Virginia pine. Steep slopes and stones severely limit the use of equipment.

These soils are poorly suited to most engineering and urban uses. Slippage is a major problem when cuts are made for roads, houses, and other uses. Steep slopes and stones are severe limitations for most uses.

These soils are in capability subclass VIIs. Bouldin soils are in woodland subclass 3x, and Gilpin soils are in woodland subclass 3r.

CaB—Capshaw silt loam, 2 to 6 percent slopes. This deep, moderately well drained, gently sloping soil is on stream terraces and uplands. Slopes are smooth and convex. Individual areas range from 2 to 40 acres.

Typically, the surface layer is yellowish brown silt loam about 4 inches thick. The subsoil extends to a depth of about 45 inches. It is yellowish brown silty clay loam in the upper part and yellowish brown clay in the middle and lower parts. The lower part of the subsoil is mottled in shades of gray and brown. The underlying material is mottled grayish brown, yellowish brown, and light olive brown clay that extends to a depth of 60 inches or more.

This soil is low in natural fertility and organic matter content. It is medium acid or strongly acid, except in areas where the surface layer has been limed and in the layers just above bedrock, which are less acid. Permeability is slow, and the available water capacity is high. Root growth and air and water movement are slightly restricted by the high clay content in the lower part of the subsoil.

Included with this soil in mapping are small areas of a soil that is somewhat poorly drained.

This soil is used mostly for row crops, hay, and pasture.

This soil is well suited to farming. Erosion is a moderate hazard if cultivated crops are grown.

This soil is well suited to use as woodland. It has no significant limitations to woodland management. Trees that grow on this soil include yellow-poplar, shortleaf pine, and loblolly pine.

This soil is poorly suited to most urban uses. Slow permeability and low strength for supporting local roads and streets are limitations that are difficult to overcome.

This soil is in capability subclass IIe and woodland subclass 3o.

CbC—Colbert silt loam, 2 to 12 percent slopes. This deep, gently sloping and sloping, moderately well drained soil is on uplands in the limestone valleys. Slopes are smooth and convex. Individual areas range from 2 to 50 acres.

Typically, the surface layer is brown silt loam about 4 inches thick. The subsoil is yellowish brown clay that extends to a depth of 45 inches. The middle and lower parts are mottled in shades of brown and gray. The underlying material is olive clay which has gray and brown mottles. Limestone bedrock is at a depth of 55 inches.

This soil is slightly acid to strongly acid, except in the layers just above bedrock, which range to mildly alkaline. Permeability is very slow, and the available water capacity is moderate. The shrink-swell potential is high.

Included with this soil in mapping are small areas of a soil that is less clayey in the upper part of the subsoil and areas of a soil that has gray mottles within 10 inches of the surface layer. Also included are a few areas of a Talbott soil that has bedrock within 40 inches of the surface and a few severely eroded areas which have a clayey surface layer.

This soil is used mostly for woodland, hay, and pasture. Some areas are used for urban housing and local commercial districts.

This soil is moderately suited to agricultural use. The very slowly permeable clay subsoil retards root growth and the movement of water and air through the soil. Row crops such as corn and soybeans grow poorly on this soil. Pasture plants, such as common bermudagrass, tall fescue, and serecia lespedeza, grow fairly well.

This soil is moderately suited to use as woodland because of moderate available water capacity and the very slowly permeable clay subsoil. Trees that grow on this soil include loblolly pine and shortleaf pine. The clayey subsoil near the surface causes seedling mortality and limits the use of equipment when the soil is wet.

This soil is poorly suited to most urban uses. The very slow permeability, low strength, and high shrink-swell potential are limitations which are difficult to overcome. Engineering works and highway and street construction are limited by the low strength, high shrink-swell potential, and depth to bedrock of this soil.

This soil is in capability subclass IVe and woodland subclass 4c.

CcD—Colbert-Rock outcrop complex, 5 to 20 percent slopes. This map unit consists of small areas of sloping and moderately steep Colbert soils and limestone Rock outcrop so intermingled that they could not be separated at the scale selected for mapping. Areas of this map unit range from about 3 to 25 acres in size, and individual areas of each component range from 0.1 acre to about 2 acres. Areas of Colbert soils make up from 35 to 70 percent of the map unit and average about 45 percent. Areas of Rock outcrop make up from 30 to 55 percent of the map unit and average about 40 percent.

Colbert soils are deep and moderately well drained. Typically, the surface layer is brown silt loam about 4 inches thick. The subsoil is yellowish brown plastic clay that extends to a depth of 45 inches. It is mottled in shades of brown and gray except in the upper 10 to 15 inches. The underlying material is olive clay which has gray and brown mottles. Limestone bedrock is at a depth of 55 inches.

Colbert soils are low in natural fertility and organic matter content. They range from slightly acid to strongly acid, except in the layers just above bedrock, which range from slightly acid to mildly alkaline. Permeability is very slow, retarding root growth and the movement of water and air through the soil. The available water capacity is only moderate because of the high clay content in the subsoil. The shrink-swell potential is high.

Rock outcrop is limestone bedrock that is exposed on the land surface. In places, the rocks are level with the surface, and in other places, the rocks extend 2 to 3 feet above the surface.

Included with this unit in mapping are numerous small areas of a soil which is less than 40 inches deep to bedrock. Also included are a few areas of a soil that is less clayey in the upper part of the subsoil. Included soils make up 10 to 15 percent of the unit.

The soils are used mostly as woodland; in a few areas they are used for unimproved pasture.

These soils are poorly suited to farming, woodland, and most engineering uses. The large number of Rock outcrops is the most limiting feature. Other limiting features are very slow permeability, and the high shrink-swell potential. Some tree species that grow on these soils are hickory, chestnut oak, and eastern redcedar.

This complex is in capability subclass VIIs. The Colbert soils are in woodland subclass 4c.

CdC—Colbert-Urban land complex, 2 to 12 percent slopes. This map unit consists of deep, moderately well drained, gently sloping and sloping Colbert soils, Urban land, and disturbed areas that have been altered during construction. The areas of soils and Urban land are so intricately mixed or so small that they could not be separated at the scale selected for mapping. Areas of this map unit range from about 5 to 150 acres in size, and individual areas of each component range from 0.1 acre to about 5 acres. Colbert soils make up 25 to 45 percent of each mapped area, Urban land 25 to 45 percent, and disturbed areas 10 to 25 percent.

Typically, Colbert soils have a surface layer of brown silt loam 4 inches thick. The subsoil is yellowish brown clay that extends to a depth of 45 inches. It is mottled in shades of brown and gray, except in the upper 10 to 15 inches. The underlying material is olive clay and has gray and brown mottles. Limestone bedrock is at 55 inches.

Colbert soils are low in natural fertility and organic matter content. They are slightly acid to strongly acid, except in the layers just above bedrock, which range to mildly alkaline. Permeability is very slow, and the available water capacity is moderate. The shrink-swell potential is high.

The Urban land part of this unit is covered by buildings, streets, parking lots, sidewalks, and other structures.

The disturbed areas have been excavated during the installation of utilities, and cut and filled during grading and shaping operations. They have been altered to the extent that individual soils cannot be identified and predictions cannot be made about their suitability for use without an onsite investigation.

Included in mapping are small areas of a soil that is less clayey in the upper part of the subsoil and areas of a somewhat poorly drained soil that has gray mottles within 10 inches of the surface layer. The somewhat poorly drained soil is on level areas and slight depressions. Also included are some areas of a Talbott soil that has limestone bedrock within 40 inches of the surface.

The Colbert soils are used for parks, open space, building sites, lawns, and gardens. They are moderately to poorly suited to lawns, gardens, trees, and shrubs; and they are poorly suited to intensive recreation developments such as football fields, baseball fields, and playgrounds. Colbert soils are poorly suited to building sites, roads, and most other engineering uses. A very slowly permeable clayey subsoil, low strength when wet, and high shrink-swell potential are the major limiting features of these soils.

The Colbert soils are in woodland subclass 4c. They are not assigned to a capability subclass.

CoC—Collegedale silt loam, 2 to 12 percent slopes. This deep, well drained, gently sloping and sloping soil is on upland areas in the valleys underlain by limestone. It formed in residuum of limestone or limestone interbedded with shale. Slopes are commonly short and irregular. They range from 2 to 12 percent but are dominantly 4 to 12 percent. Individual areas range from 2 to 25 acres.

Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil extends to a depth of 80 inches or more. It is yellowish red clay and has mottles in shades of brown and yellow.

The soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is moderate to high.

Included with this soil in mapping are small areas of a soil which has a silty clay loam surface layer and a brown clayey subsoil. Also included are small areas of severely eroded soils that have a clay surface layer.

This soil is used mostly for woodland, hay, and pasture. Some areas are used for urban housing.

This soil is only moderately suited to use as woodland because of low fertility and the plastic clayey subsoil, which retards root growth. It has no significant limitations to woodland management. Trees that grow on this soil include loblolly pine and Virginia pine.

This soil is poorly suited to cultivated crops and moderately suited to hay and pasture. Slope and the plastic clayey subsoil are the major limitations. The clayey subsoil retards root growth and the movement of air and water through the soil. Erosion is a hazard if cultivated crops are grown.

This soil is poorly suited to most urban uses because it has moderately slow permeability and low strength when wet.

This soil is in capability subclass IVe and woodland subclass 3o.

CoD—Collegedale silt loam, 12 to 25 percent slopes. This deep, well drained, moderately steep soil is on uplands in the valleys underlain by limestone. It formed in residuum of limestone or limestone interbedded with shale. Slopes are commonly smooth and short. Individual areas range from 2 to 25 acres.

Typically, the surface layer is brown silt loam about 6 inches thick. The subsoil extends to a depth of 80 inches or more. It is yellowish red clay and has mottles in shades of brown and yellow.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately slow, and the available water capacity ranges from moderate to high.

Included with this soil in mapping are soils which have a silty clay loam surface layer and a brown subsoil. Also included are small areas of a soil that has more than 10 percent fragments of chert in the surface layer.

This soil is used mostly for woodland, hay, and pasture. Some areas are used for urban housing.

This soil is only moderately suited to use as woodland because of low natural fertility and the plastic clayey subsoil, which retards root growth. It has no significant limitations to woodland management.

This soil is poorly suited to cultivated crops and moderately suited to hay and pasture. Slope and the plastic clayey subsoil are the major limitations. The clayey subsoil retards root growth and the movement of water and air through the soil. Erosion is a hazard if cultivated crops are grown.

This soil is poorly suited to most urban uses because it has moderately slow permeability and low strength when wet.

This soil is in capability subclass VIe and woodland subclass 3o.

CrB—Crossville loam, 2 to 5 percent slopes. This moderately deep, well drained, gently sloping soil is on broad plateaus of the Cumberland Mountains. It formed in materials weathered from acid sandstone. The slopes are smooth and convex. Individual areas range from 2 to 25 acres.

Typically, the surface layer is very dark grayish brown loam about 10 inches thick. The subsoil extends to a depth of 28 inches. It is brown and dark yellowish brown loam. The underlying material is yellowish brown loamy sand that is underlain by sandstone bedrock at 32 inches.

This soil is strongly acid throughout, except in areas where the surface layer has been limed. Natural fertility is low, and organic matter content is medium. Permeability is moderate, and the available water capacity is moderate. Tilth is good, and the root zone is moderately deep.

Included with this soil in mapping are small areas of a soil that has a higher clay content in the subsoil. Also included are some areas of Ramsey soil and a few areas of Rock outcrops.

This soil is used mostly for woodland and pasture, but some cultivated crops are grown.

This soil is moderately suited to use as woodland. The moderate available water capacity, low natural fertility, and moderately deep root zone are limitations. Trees which grow on this soil include shortleaf pine and Virginia pine.

This soil is well suited to farming. The moderate available water capacity and the moderately deep root zone are limitations; however, the rainfall distribution is good enough in most years to produce moderately high yields if the soil is adequately fertilized.

This soil is poorly to moderately suited to most urban uses because of the moderate depth to bedrock. Depth to bedrock is a severe limitation for houses with basements, septic tank absorption fields, most engineering works, and highway construction.

This soil is in capability subclass IIe and woodland subclass 4o.

DeB—Dewey silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on uplands in the limestone valleys. Slopes are smooth and convex. Individual areas range from 3 to 10 acres.

Typically, the surface layer is dark reddish brown silt loam about 4 inches thick. The subsoil is red and dark red clay that extends to a depth of 60 inches. The lower part of the subsoil is mottled in shades of red and brown.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high.

Included with this soil in mapping are soils that have a loamy subsoil and areas of Fullerton soil that have 15 to 35 percent by volume fragments of chert throughout. Also included are some small areas where the slopes are greater than 6 percent.

This soil is used for cultivated crops, hay, and pasture. A few small areas are in woodland. Areas of this soil near urban developments are used for housing.

This soil is well suited to farming. All cultivated crops and hay and pasture crops grow well on this soil. Erosion is a hazard if cultivated crops are grown.

This soil is well suited to use as woodland. Limitations are slight and are easily overcome by good management. Trees which grow on this soil include yellow-poplar, white oak, shortleaf pine, and loblolly pine.

This soil is moderately suited to most urban uses. Shrink-swell potential is a moderate limitation for dwellings and small commercial buildings. Low strength is a severe limitation for local roads and streets. These limitations can be overcome by good design.

This soil is in capability subclass IIe and woodland subclass 3o.

DeD—Dewey silt loam, 12 to 25 percent slopes. This deep, well drained, moderately steep soil is on uplands in the valleys underlain by limestone. Slopes are smooth and convex. Individual areas range from 5 to 20 acres.

Typically, the surface layer is dark reddish brown silt loam or silty clay loam about 4 inches thick. The subsoil is red or dark red clay that extends to a depth of 60 inches. The lower part of the subsoil is mottled in shades of brown and red.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high.

Included with this soil in mapping are small areas of soils that have a loamy subsoil and areas of Fullerton soils that are 15 to 35 percent chert throughout. Also included are small severely eroded areas where the surface layer is clayey.

This Dewey soil is used mostly for pasture, hay, woodland, and some row crops.

This soil is moderately suited to farming. Slope limits the use of machinery and equipment for cultivated crops. This soil is well suited to pasture and hay crops. Erosion is a severe hazard if cultivated crops are grown.

This soil is well suited to use as woodland. It has no significant limitations to woodland use and management. Trees that grow on this soil include yellow-poplar, white oak, and shortleaf pine.

This soil is poorly suited to most urban uses. Slope is a severe limitation for most uses.

This soil is in capability subclass IVe and woodland subclass 3o.

Du—Dunning silty clay loam. This deep, poorly drained, nearly level, slowly permeable soil is along streams in the limestone valleys. Slopes are commonly smooth and slightly concave. Individual areas range from 2 to 10 acres.

Typically, the surface layer is very dark grayish brown silty clay loam 7 inches thick and the subsurface layer is very dark gray silty clay loam about 12 inches thick. The subsoil extends to 46 inches and is dark gray clay. The underlying material is dark gray clay and extends to a depth of 60 inches or more.

This soil is mildly alkaline or neutral in all layers. Permeability is slow, and the available water capacity is moderate. Shrink-swell potential is moderate. A seasonal high water table and a clayey, slowly permeable subsoil retard root growth and air movement. Tilth is poor because of the silty clay loam surface layer. This soil is frequently flooded during the winter and early spring.

Included with this soil in mapping are small areas of soils that have a lighter colored surface layer and are somewhat poorly drained.

This soil is used for pasture and woodland and for growing soybeans.

This soil is poorly suited to most cultivated crops because the water table is near the surface until late spring or early summer. Soybeans produce good yields if the soil dries out early enough for planting. This soil is well suited to water-tolerant grasses and legumes, such as tall fescue and ladino clover.

This soil is well suited to tree species that can withstand flooding and long periods of wetness. Trees which grow on this soil include sweetgum, pine oak, and willow oak.

This soil is poorly suited to most urban uses. The frequent flooding, wetness, and the slowly permeable clay subsoil are severe limitations that are difficult to overcome.

This soil is in capability subclass IIIw and woodland subclass 1w.

Ec—Emory silt loam. This deep, well drained, nearly level and gently sloping soil is in narrow valleys and in depressions. Slopes are commonly slightly concave, ranging from 0 to 4 percent. Individual areas range from 2 to 5 acres.

Typically, the surface layer is dark reddish brown silt loam about 7 inches thick. The subsoil extends to a depth of 60 inches or more. It is dark reddish brown silt loam in the upper part and strong brown silty clay loam in the lower part.

This soil is medium in natural fertility and organic matter content. It is strongly acid or medium acid throughout, except in areas where the surface layer has been limed. This soil has high available water capacity, good tilth, and a deep root zone. This soil is subject to occasional flooding.

Included with this soil in mapping are small areas of soils that have a clayey subsoil and areas of soils that have fragments of chert in the surface layer.

This soil is used mostly for row crops, but in some areas it is used for hay, pasture, or woodland.

This soil is well suited to all of the crops commonly grown in the county. The soil is flooded occasionally during the winter months, but annual crops are seldom damaged.

This soil is well suited to use as woodland. It has no significant limitations to woodland use and management. Trees that grow on this soil include yellow-poplar, black walnut, and loblolly pine.

This soil is poorly suited to most urban uses because of occasional flooding and low strength.

This soil is in capability class 1 and woodland subclass 2o.

EdC—Enders silt loam, 2 to 12 percent slopes. This deep, well drained, gently sloping to sloping soil is on uplands underlain by shale. Slopes are smooth and convex. Individual areas range from 2 to 25 acres.

Typically, the surface layer is brown silt loam 6 inches thick. The subsoil extends to a depth of 38 inches. It is brown silt loam in the upper 4 inches and yellowish red silty clay and clay below. The underlying material is mottled red, gray, and brown very shaly clay that extends to soft, weathered shale at a depth of about 47 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is very slow, and available water capacity is moderate. The root zone is moderately deep. The shrink-swell potential is high.

Included with this soil in mapping are small areas of soils that have a loamy subsoil and areas of soils that are less than 40 inches to shale bedrock and have fragments of shale throughout. Also included are small eroded areas where the surface layer is silty clay loam.

This soil is used mostly for crops, hay, and pasture. A few areas that were once cleared are now in woodland.

This soil is only moderately suited to cultivated crops. The moderate depth of the root zone, the moderate available water capacity, and the clayey, slowly permeable subsoil retard root growth and the movement of air and water throughout the soil. This soil is best suited to hay and pasture crops that have most of their growth in the fall and spring. Erosion is a hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland. Production is limited by the moderate available water capacity, high clay content, low natural fertility, and moderately deep root zone. The soil has no significant limitations to woodland management. Trees which grow on this soil include southern red oak, white oak, and loblolly pine.

This soil is poorly suited to most urban uses. Low strength, very slow permeability, and high shrink-swell potential are limitations.

This soil is in capability subclass IVe and woodland subclass 4o.

EeD—Enders silty clay loam, 12 to 25 percent slopes, eroded. This deep, well drained, moderately steep soil is on shale ridges. The slopes are smooth and convex. Individual areas range from 2 to 20 acres.

Typically, the surface layer is reddish brown silty clay loam 5 inches thick. The subsoil extends to a depth of 32 inches. It is yellowish red silty clay in the upper part and yellowish red clay in the lower part. The underlying material is mottled very shaly clay that extends to shale bedrock at a depth of about 41 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is very slow, and the available water capacity is moderate or low. The shrink-swell potential is high. This soil has poor tilth and a moderately deep root zone.

Included with this soil in mapping are small areas of Montevallo and Armuchee soils, both of which are less than 40 inches to shale bedrock. Also included are severely eroded areas where the surface layer is clayey.

Most of the acreage is used as woodland. A few areas are used for cultivated crops and pasture.

This soil is poorly suited to cultivated crops and only moderately suited to hay and pasture. Suitability is limited by slope, low natural fertility, moderate or low available water capacity, and poor workability. This soil is best suited to hay and pasture crops which have most of their growth in the fall and spring. Erosion is a severe hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland. Productivity is limited by low available water capacity and low natural fertility. Trees that grow on this soil include eastern redcedar and loblolly pine.

This soil is poorly suited to most urban uses. Limitations are very slow permeability, low strength, high shrink-swell potential, depth to rock, and slope. These limitations are difficult to overcome.

This soil is in capability subclass VIe and woodland subclass 4o.

EgC—Enders gravelly loam, 2 to 12 percent slopes. This deep, well drained, gently sloping to sloping soil is on uplands underlain by shale. Slopes are smooth and convex. Individual areas range from 5 to 50 acres.

Typically, the surface layer is dark yellowish brown gravelly loam about 6 inches thick. The subsoil extends to a depth of 44 inches. It is strong brown gravelly silt loam in the upper 6 inches and yellowish red silty clay and clay in the middle and lower parts. The underlying material is mottled red, gray, and brown very shaly clay. Rippable shale is at a depth of 55 inches. In some areas, cobblestones as large as 5 inches across are in the surface layer.

This soil is strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate in the upper part of the subsoil and very slow in the lower part. The available water capacity is moderate. The surface layer is friable, but the pebbles and cobblestones interfere with tillage in places. The root zone is deep.

Included with this soil in mapping are small areas of soils that have a loamy subsoil and small areas of soils that do not contain pebbles.

This soil is used mostly for woodland, hay, and pasture.

This soil is poorly suited to use as cropland. In places, the pebbles and cobblestones interfere with tillage. The gravelly surface layer and moderate available water capacity are additional limitations.

This soil is moderately suited to use as pasture and hayland. The gravelly surface layer and moderate available water capacity are limitations to these uses.

This soil is moderately suited to use as woodland. It has no significant limitations to woodland use and management. Trees that grow on this soil include eastern redcedar, southern red oak, shortleaf pine, and loblolly pine.

This soil is poorly suited to most urban uses. Low strength, very slow permeability, and high shrink-swell potential severely limit these uses.

This soil is in capability subclass IVe and woodland subclass 4o.

EhC—Enders-Urban land complex, 2 to 12 percent slopes. This map unit consists of small areas of deep, well drained, gently sloping to sloping Enders soils, Urban land, and disturbed soils. The areas of soils and the areas of Urban land are so intricately mixed or so small that it was not practical to separate them at the scale of mapping used. Areas of this map unit range from about 5 to 100 acres, and individual areas of each component range from 0.1 acre to about 5 acres. Enders soils make up 25 to 45 percent of each mapped area, Urban land makes up 25 to 45 percent, and disturbed areas make up 10 to 25 percent.

Typically, the Enders soils have a surface layer of brown silt loam about 6 inches thick. The subsoil extends to a depth of 38 inches. It is brown silt loam in the upper few inches. Below this is yellowish red silty clay and clay. The underlying material is mottled red, gray, and brown very shaly clay that extends to soft, weathered shale at a depth of about 47 inches.

Enders soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout, except in areas where the surface layer has recently been limed. Permeability is very slow, and the available water capacity is moderate. The shrink-swell potential is high.

The Urban land part of this unit is covered by buildings, streets, parking lots, sidewalks, and other structures.

The disturbed areas have been excavated during the installation of utilities and cut and filled during grading and shaping operations. They have been altered to the extent that individual soils cannot be identified and predictions cannot be made about their suitability for use without an onsite investigation.

Included in mapping are small areas of Armuchee and Montevallo soils. Armuchee soils are moderately deep to soft weathered shale, and Montevallo soils are shallow to soft weathered shale.

The Enders soils are used for parks, open space, building sites, lawns, and gardens. They are moderately suited to lawns, gardens, trees, and shrubs. They are poorly suited to intensive recreation developments, such as playgrounds, and to most engineering uses. The low strength of the soils when they are wet and the high shrink-swell potential of these soils are limiting features.

The Enders soils are in woodland subclass 4o. They are not assigned to a capability subclass.

En—Ennis cherty silt loam. This deep, well drained, nearly level cherty soil is on bottom lands, along drainageways, and in depressions. It formed in alluvium that derived from soils underlain by limestone and shale. Slopes are smooth and slightly concave. They range from 0 to 2 percent. Individual areas range from 2 to 5 acres.

Typically, the surface layer is dark yellowish brown cherty silt loam about 6 inches thick. The subsoil extends to 45 inches. It is dark yellowish brown cherty silt loam in the upper part, yellowish brown cherty silt loam in the middle part, and yellowish brown cherty silty clay loam in the lower part. The substratum is yellowish brown cherty silty clay loam that extends to a depth of 60 inches or more.

This soil is low in natural fertility and organic matter content. It is strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately rapid. The available water capacity is high, and the root zone is deep. This soil is subject to occasional flooding.

Included with this soil in mapping are small areas of moderately well drained soils that have gray mottles within 20 inches of the surface.

This soil is used mostly for woodland, hay, and pasture, but in some areas it is used for cultivated crops.

This soil is well suited to row crops, hay, and pasture. It is flooded occasionally during the winter and spring. Flooding and chert fragments in the soil are the only significant limitations to use of this soil as cropland.

This soil is well suited to use as woodland because of the deep root zone and high available water capacity. It has no significant limitations to woodland use or management. Trees which grow on this soil include yellow-poplar, white oak, and black walnut.

This soil is poorly suited to most urban uses because of flooding.

This soil is in capability subclass IIw and woodland subclass 2o.

EtB—Etowah silt loam, 2 to 5 percent slopes. This deep, well drained, gently sloping soil is on stream terraces, alluvial fans, and foot slopes. Slopes are commonly smooth and short. Individual areas range from 2 to 8 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil extends to a depth of 62 inches or more. It is reddish brown silt loam in the upper part and red silty clay loam in the middle and lower parts.

This soil is medium in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. The soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of a soil that has a red clayey subsoil. Also included are some small areas where the slopes are greater than 5 percent.

This soil is used mostly for cultivated crops, hay, and pasture. A few small areas are in woodland.

This soil is well suited to row crops and small grain (fig. 1). High yields can be obtained. There are no significant limitations to the use of this soil as farmland. Erosion is a hazard if cultivated crops are grown.

This soil is well suited to use as woodland. It has no significant limitations to woodland use and management. Trees which grow on this soil include black walnut, yellow-poplar, southern red oak, and loblolly pine.

This soil is well suited to most urban uses. There are no significant limitations which cannot be overcome by proper design and construction.

This soil is in capability subclass IIe and woodland subclass 2o.

EtD—Etowah silt loam, 12 to 20 percent slopes. This deep, well drained, moderately steep soil is on stream terraces and side slopes of ridges. Slopes are commonly smooth and convex. Individual areas range from 2 to 40 acres.

Typically, the surface layer is dark brown silt loam about 6 inches thick. The subsoil extends to a depth of 62 inches or more. It is reddish brown silt loam in the upper part and red silty clay loam in the middle and lower parts.

This soil is medium in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of a soil which has a red clayey subsoil.

This soil is used mostly for hay and pasture. Cultivated crops are grown on the smoother slopes.

This soil is moderately suited to row crops and small grain. It is well suited to pasture. Erosion is a severe hazard if cultivated crops are grown.

This soil is well suited to use as woodland. Trees that grow on this soil include yellow-poplar, black walnut, southern red oak, and loblolly pine. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Slope is the major limitation, but it can be overcome by good design.

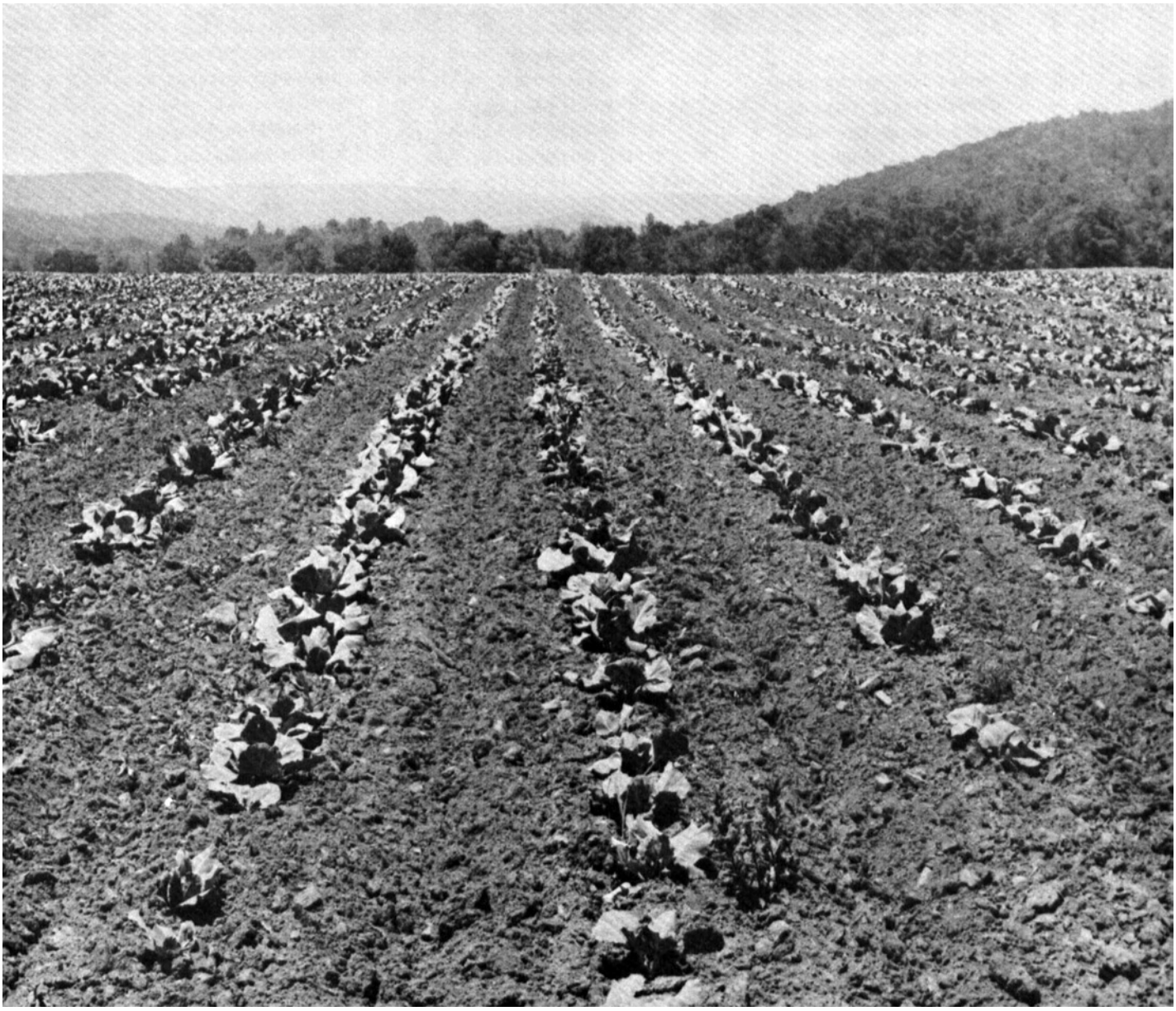

Figure 1.—Vegetables growing on Etowah silt loam, 2 to 5 percent slopes. This soil is well suited to all commonly grown crops.

This soil is in capability subclass IVe and woodland subclass 2o.

FuB—Fullerton cherty silt loam, 3 to 7 percent slopes. This deep, well drained, gently sloping, cherty soil is on ridgetops and upper side slopes. Slopes are commonly smooth and convex. Individual areas range from 2 to 50 acres.

Typically, the surface layer is dark grayish brown cherty silt loam about 3 inches thick. The subsurface layer is brown cherty silt loam about 7 inches thick. The subsoil is red cherty clay that extends to a depth of 65 inches or more.

This soil is low in natural fertility and organic matter content. It is strongly acid, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is moderate or high. The root zone is deep.

Included with this soil in mapping are small areas of soils which have more than 35 percent fragments of

chert in the subsoil. Also included are some small areas which have slopes greater than 7 percent.

A large acreage of this soil has been cleared and is used for cultivated crops, hay, and pasture.

This soil is well suited to cultivated crops and pasture. Most cultivated crops produce moderate to high yields if adequately fertilized. Chert fragments in the surface layer and low natural fertility are the most limiting features of this soil. Erosion is a moderate hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland. Productivity is limited by low natural fertility. This soil has no significant limitations to woodland use or management. Trees which grow on this soil include loblolly pine, shortleaf pine, and yellow-poplar.

This soil is well suited to most urban uses. There are no limitations that cannot be overcome by good design and construction.

This soil is in capability subclass IIe and woodland subclass 3o.

FuD—Fullerton cherty silt loam, 12 to 25 percent slopes. This deep, well drained, moderately steep soil is on side slopes of ridges that are underlain by limestone. Slopes are commonly smooth and convex. Individual areas range from 2 to 100 acres.

Typically, the surface layer is dark grayish brown cherty silt loam about 3 inches thick. The subsurface layer is brown cherty silt loam about 7 inches thick. The subsoil is red cherty clay that extends to a depth of 65 inches or more.

This soil is low in natural fertility and organic matter content. It is strongly acid, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is moderate or high. The root zone is deep.

Included with this soil in mapping are small areas of soils that have more than 35 percent fragments of chert in the subsoil. Also included are small eroded areas where the surface layer is more clayey.

This soil is used mostly for woodland. A few areas are used for pasture and hay.

This soil is poorly suited to cultivated crops and moderately suited to pasture (fig. 2). It is best suited to perennial pasture grasses. Slope, chert content, and low natural fertility are the most limiting soil features. Erosion is a severe hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland. Productivity is limited by low natural fertility. This soil has no significant limitations to woodland use or management. Trees that grow on this soil include yellow-poplar, loblolly pine, and southern red oak.

This soil is poorly to moderately suited to most urban uses. Slope is a severe limitation for most uses.

This soil is in capability subclass IVe and woodland subclass 3o.

FuE—Fullerton cherty silt loam, 25 to 40 percent slopes. This deep, well drained, steep soil is on side slopes of ridges underlain by limestone. Slopes are commonly smooth and convex. Individual areas range from 2 to 75 acres.

Typically, the surface layer is dark grayish brown cherty silt loam about 3 inches thick. The subsurface layer is brown cherty silt loam about 7 inches thick. The subsoil is red cherty clay that extends to a depth of 65 inches or more.

This soil is low in natural fertility and organic matter content. It is strongly acid throughout, except in areas where the surface layer has been limed. Both permeability and the available water capacity are moderate. The root zone is deep.

Included with this soil in mapping are small areas of soils that have more than 35 percent by volume fragments of chert in the subsoil. Also included are small areas of soils, on the lower part of slopes and benches, that have a subsoil of cherty silty clay loam.

This soil is used mostly for woodland. It is moderately suited to woodland. Productivity is limited by low natural fertility. Slope causes this soil to have a moderate hazard of erosion and is a moderate limitation to the use of equipment.

This soil is poorly suited to farming because of steep slopes.

This soil is poorly suited to most urban uses because of steep slopes. Slope is a severe limitation to the construction of utility lines, dwellings, roads, and streets.

This soil is in capability subclass VIe and woodland subclass 3r.

FwD—Fullerton-Urban land complex, 3 to 40 percent slopes. This map unit consists of deep, well drained, gently sloping to steep Fullerton soils, Urban land, and disturbed areas that have been altered during construction. These areas are so intricately mixed or small that they could not be separated at the scale selected for mapping. Areas of this map unit range from about 20 to 200 acres, and individual areas of each component range from about 0.1 acre to about 5 acres. Fullerton soils make up 30 to 50 percent of each mapped area, Urban land 25 to 45 percent, and disturbed areas 10 to 20 percent.

Typically, Fullerton soils have a surface layer of dark grayish brown and brown cherty silt loam about 10 inches thick. The subsoil extends to a depth of 65 inches or more. It is yellowish red cherty silty clay loam in the upper few inches and red cherty clay below.

Fullerton soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid throughout, except in areas where the surface layer has recently been limed. These soils have a deep, moderately permeable root zone, but the available water capacity is only moderate because of the clayey subsoil and large number of chert fragments.

The Urban land part of this unit is covered by buildings, streets, parking lots, sidewalks, and other structures.

The disturbed areas have been excavated during the installation of utilities and cut and filled during grading and shaping operations. They have been altered to the extent that individual soils cannot be identified. These areas are so variable that predictions cannot be made about their suitability for use without an onsite investigation.

Included with this unit in mapping are areas of Bodine soils which have a subsoil that is loamy and very cherty.

The Fullerton soils are used for parks, open space, building sites, lawns, and gardens. They are only moderately suited to lawns, gardens, trees, and shrubs. Chert fragments in the surface layer and the moderate available water capacity are limitations for these uses. These soils are moderately suited to building sites, roads, and most other engineering uses, except in the steep areas, where they are poorly suited because of slope. They are poorly suited to use as football fields, baseball fields, and playgrounds because of slope and the fragments of chert in the surface layer.

The Fullerton soils are in woodland subclass 3r. They are not assigned to a capability subclass.

GpD—Gilpin silt loam, 12 to 25 percent slopes. This moderately deep, moderately steep, well drained soil is on shale ridges of the Cumberland Mountains. Slopes are commonly smooth and convex. Individual areas range from 5 to 25 acres.

Typically, the surface layer is dark grayish brown and yellowish brown silt loam about 8 inches thick. The subsoil extends to 24 inches and is strong brown shaly silt loam. The substratum is yellowish brown shaly silt loam that extends to rippable shale at 30 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has

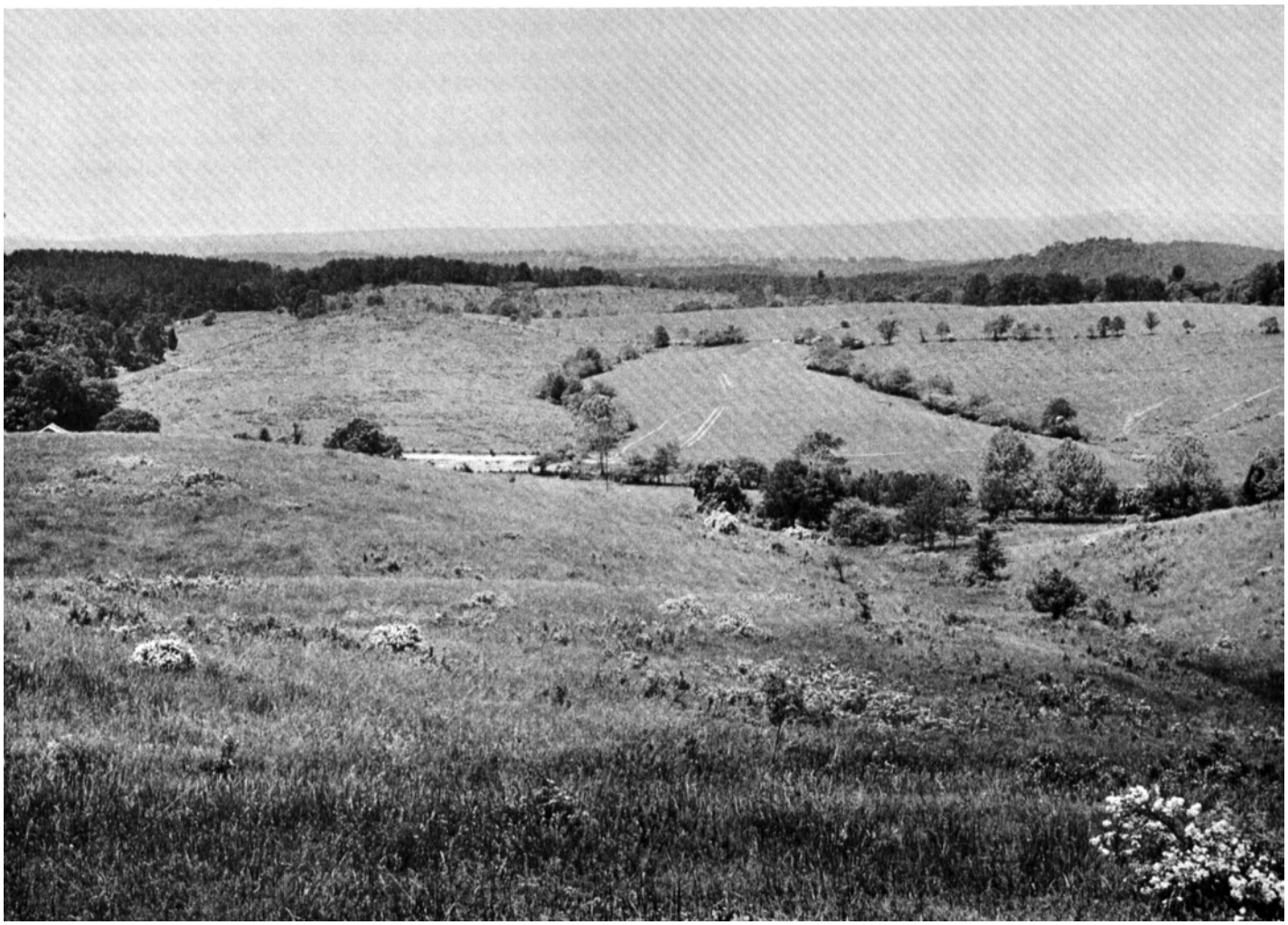

Figure 2.—Unimproved pasture on Fullerton cherty silt loam, 12 to 25 percent slopes.

been limed. Both permeability and the available water capacity are moderate. The root zone is moderately deep.

Included with this soil in mapping are soils that have a clayey subsoil.

This soil is used mostly for woodland. A few small areas have been cleared and are used for hay and pasture.

This soil is moderately suited to hay and pasture and poorly suited to cultivated crops. Erosion is a severe hazard if cultivated crops are grown. Slope limits the use of machinery and equipment.

This soil is moderately suited to use as woodland. Productivity is only moderate because of low natural fertility and moderate available water capacity. Trees which grow on this soil include northern red oak and yellow-poplar.

This soil is poorly suited to most urban uses because of moderate depth to bedrock and slope.

This soil is in capability subclass IVe and woodland subclass 3r.

GpE—Gilpin silt loam, 25 to 40 percent slopes. This moderately deep, steep, well drained soil is on shale ridges of the Cumberland Mountains. Slopes are commonly smooth and convex. Individual areas range from 5 to 50 acres.

Typically, the surface layer is dark grayish brown and yellowish brown silt loam about 8 inches thick. The subsoil extends to a depth of 24 inches and is strong brown shaly silt loam. The substratum is yellowish brown shaly silt loam that extends to rippable shale at a depth of 30 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid, except in areas where the surface layer has been limed. Both permeability and the available water capacity are moderate. The root zone is moderately deep.

Included with this soil in mapping are small areas of soils that are less than 20 inches deep to bedrock and small areas of soils that have a clayey subsoil.

This soil is used for woodland. It is moderately suited to this use. Slope is a limitation to woodland use and management of this soil. Trees which grow on this soil include northern red oak and yellow-poplar.

This soil is poorly suited to farming. Slope limits the use of machinery and equipment.

This soil is poorly suited to urban uses because of slope and moderate depth to bedrock.

This soil is in capability subclass VIe and woodland subclass 3r.

Gu—Guthrie silt loam. This deep, nearly level, poorly drained soil has a compact, slowly permeable fragipan in the subsoil. It is on upland flats and in depressions. Slopes are smooth and slightly concave. Individual areas range from 2 to 10 acres.

Typically, the surface layer is grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part of the subsoil is light gray silt loam and has brown mottles. The lower part is a mottled gray and brown silt loam fragipan that is compact and brittle.

Included with this soil in mapping are small areas of a somewhat poorly drained soil at slightly higher elevations.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid. Permeability is slow, and the available water capacity is moderate. The root zone is only moderately deep over the compact fragipan, which retards root growth and water movement. This soil has a perched water table that is near the surface during winter and spring. Flooding is an occasional hazard.

This soil is used mostly for woodland, but a few areas have been cleared and are used for pasture.

This soil is poorly suited to row crops and moderately suited to pasture and hay. A high water table and moderately deep root zone are major limitations. The soil stays wet too late in the spring to plant row crops. It is best suited to water-tolerant grasses and legumes.

This soil is moderately suited to woodland. Wetness causes seedling mortality and severely limits the use of equipment, restricting it to late summer and fall, when the soil is driest. Trees which grow on this soil include willow oak, sweetgum, and loblolly pine.

This soil is poorly suited to urban uses. Wetness, flooding, and slow permeability are severe limitations.

This soil is in capability subclass IVw and woodland subclass 2w.

Ha—Hamblen silt loam. This deep, moderately well drained, nearly level soil is on flood plains of streams and drainageways. Slopes are commonly less than 2 percent, but they range up to 3 percent. Individual areas range from 2 to 10 acres.

Typically, the surface layer is brown silt loam about 10 inches thick. The subsoil is brown silt loam mottled in shades of gray and brown below about 18 inches. The substratum from 32 to 60 inches is brown silt loam mottled in shades of gray and brown.

This soil is medium in natural fertility and organic matter content. It is neutral to strongly acid. Permeability is moderate, and the available water capacity is high. The root zone is deep and easily penetrated by roots. This soil is flooded occasionally.

Included with this soil in mapping are small areas of the well drained Staser soil and small areas of the somewhat poorly drained Newark soil in low areas and depressions.

This soil is used mostly for cultivated crops, hay, and pasture. A few small, irregularly shaped areas are in woodland.

This soil is well suited to cultivated crops. Runoff is slow because of the nearly level slopes. Most areas are subject to occasional flooding (fig. 3). Flooding may cause some crop damage during periods of heavy rainfall.

This soil is well suited to woodland. Trees that grow on this soil include northern red oak, yellow-poplar, and loblolly pine. Flooding limits the use of machinery and equipment during periods of heavy rainfall.

This soil is poorly suited to most urban uses. Wetness and flooding are limitations that are difficult to overcome.

This soil is in capability subclass IIw and woodland subclass 2w.

HcD—Hanceville loam, 12 to 25 percent slopes. This deep, well drained, moderately steep soil is on slopes and benches of White Oak Mountain. Slopes are smooth and convex. Individual areas range from 2 to 100 acres.

Typically, the surface layer is dark reddish brown loam about 6 inches thick. The subsoil is dark red clay in the upper part and dark red clay loam in the lower part. Sandstone bedrock is at 64 inches.

This soil is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. It is low in natural fertility and medium in organic matter content. Permeability is moderate, and the available water capacity is high. This soil has good tilth and a deep root zone.

Figure 3.—Hamblen silt loam. This soil is subject to occasional flooding.

Included with this soil in mapping are small areas of a loamy soil that is less than 60 inches to bedrock.

This soil is used mostly for woodland.

This soil is moderately suited to farming. Slope limits the use of equipment. Erosion is a severe hazard if cultivated crops are grown.

This soil is moderately suited to woodland. It has no significant limitations to woodland management. Trees which grow on this soil include loblolly pine, shortleaf pine, and Virginia pine.

This soil is poorly suited to urban use. Slope severely limits most uses.

This soil is in capability subclass IVe and woodland subclass 4o.

HcE—Hanceville loam, 25 to 40 percent slopes. This deep, well drained, steep soil is on slopes and benches of White Oak Mountain. Slopes are commonly smooth and convex. Individual areas range from 10 to 100 acres.

Typically, the surface layer is reddish brown loam about 6 inches thick. The subsoil is dark red clay in the upper part and dark red clay loam in the lower part. Sandstone bedrock is at a depth of 64 inches.

This soil is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. It has low natural fertility and medium organic matter content. It is moderately permeable and has moderate available water capacity. Tilth is good and the root zone is deep.

Included with this soil in mapping are small areas of a loamy soil that is less than 60 inches to bedrock.

This soil is used mostly for woodland.

This soil is poorly suited to farming because of slope. Erosion is a severe hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland. Slope moderately limits the use of equipment and machinery. Trees which grow on this soil include loblolly pine, shortleaf pine, and Virginia pine.

This soil is poorly suited to most urban uses. Slope is a severe limitation. Road construction requires deep cuts and high fills.

This soil is in capability subclass VIe and woodland subclass 4r.

HoB—Holston loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on uplands and high stream terraces. Slopes are normally smooth and convex. Individual areas range from 2 to 10 acres.

Typically, the surface layer is brown loam about 8 inches thick. The subsoil extends to a depth of 75 inches. It is yellowish brown loam and clay loam in the upper part and strong brown clay loam in the lower part.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of a soil that has more than 15 percent gravel in the surface layer and subsoil. Also included are areas of a soil that has a yellowish red subsoil and some areas which have slopes greater than 6 percent.

Most areas of this soil have been cleared and are used for cultivated crops, hay, and pasture. A few small areas are still in woodland.

This soil is well suited to farming. Corn, small grain, legumes, and grasses grow well on this soil. Erosion is a hazard if cultivated crops are grown. There are no other significant limitations to the use of this soil as cropland.

This soil is well suited to woodland. It has no significant limitations to woodland use and management. Trees which grow on this soil include yellow-poplar, shortleaf pine, and Virginia pine.

This soil is well suited to most urban uses. There are no limitations that cannot be overcome by good design and construction.

This soil is in capability subclass IIe and woodland subclass 3o.

HoD—Holston loam, 10 to 20 percent slopes. This deep, well drained, sloping to moderately steep soil is on high stream terraces. Slopes are normally smooth and convex. Individual areas range from 2 to 10 acres.

Typically, the surface layer is brown loam about 8 inches thick. The subsoil extends to a depth of 75 inches. It is yellowish brown loam and clay loam in the upper part and strong brown clay loam in the lower part.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of a soil that has gravel or fragments of chert in the surface layer. Also included are small areas that have a yellowish red subsoil.

This soil is used mostly for hay and pasture. A few small areas are still in woodland.

This soil is moderately suited to farming. Slope is a limitation if cultivated crops are grown, and erosion is a severe hazard.

This soil is well suited to use as woodland. It has no significant limitations to woodland use or management. Trees which grow on this soil include yellow-poplar, shortleaf pine, and Virginia pine.

This soil is moderately suited to urban use. Slope is a limitation, but it can generally be overcome by good design and construction.

This soil is in capability subclass IVe and woodland subclass 3o.

HuB—Humphreys cherty silt loam, 1 to 6 percent slopes. This deep, well drained, gently sloping soil is on terraces, alluvial fans, and foot slopes. Individual areas range from 2 to 8 acres.

Typically, the surface layer is dark brown cherty silt loam about 7 inches thick. The subsoil to a depth of 60 inches is dark yellowish brown cherty silt loam in the upper part and strong brown cherty silty clay loam in the lower part.

This soil is low in natural fertility. It is strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately rapid, and the available water capacity is high. The root zone is deep and easily penetrated by roots.

Included with this soil in mapping are small areas of Minvale soils on the upper part of foot slopes and areas of Roane soils on similar positions. Roane soils are moderately well drained and have a fragipan. Also included are small areas of Ennis and Lobelville soils, on the lowest part of the landscape near streams.

This soil is used mainly for cultivated crops, hay, or pasture. It is well suited to cultivated crops, hay, and pasture. The fragments of chert in the soil may interfere with tillage. Most areas of this soil are flooded during unusually high floods.

This soil is well suited to use as woodland. It has no significant limitations to woodland use and management. Trees which grow on this soil include yellow-poplar, black walnut, and northern red oak.

This soil is moderately to poorly suited to most urban uses. Flooding severely limits many uses.

This soil is in capability subclass IIe and woodland subclass 2o.

LlB—Lily loam, 2 to 7 percent slopes. This moderately deep, well drained, gently sloping soil is on the tops of White Oak, Grindstone, and Cumberland Mountains. Slopes are smooth and convex. Individual areas range from 2 to 100 acres.

Typically, the surface layer is dark grayish brown and pale brown loam about 6 inches thick. The subsoil is yellowish brown loam in the upper part. Below this is yellowish brown clay loam and sandy clay loam that extends to sandstone bedrock at 37 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately rapid, and the available water capacity is moderate or high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is moderately deep.

Included with this soil in mapping are small areas of soils that have a red clay loam subsoil and small areas of soils which have a silt loam surface layer and are deeper to bedrock. Also included are some small areas where the slopes are greater than 7 percent.

This soil is used mostly for woodland, cultivated crops, hay, pasture, and vegetable crops (fig. 4). Most of the acreage is in woodland.

This soil is well suited to farming. Cultivated crops, small grain, hay, and pasture grow well on this soil if adequately fertilized. Erosion is a hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland. Productivity is limited by the available water capacity, moderately deep root zone, and low natural fertility. This soil has no significant limitations to woodland use or management. Trees which grow on this soil include loblolly pine, shortleaf pine, and Virginia pine.

This soil is moderately suited to most urban uses.

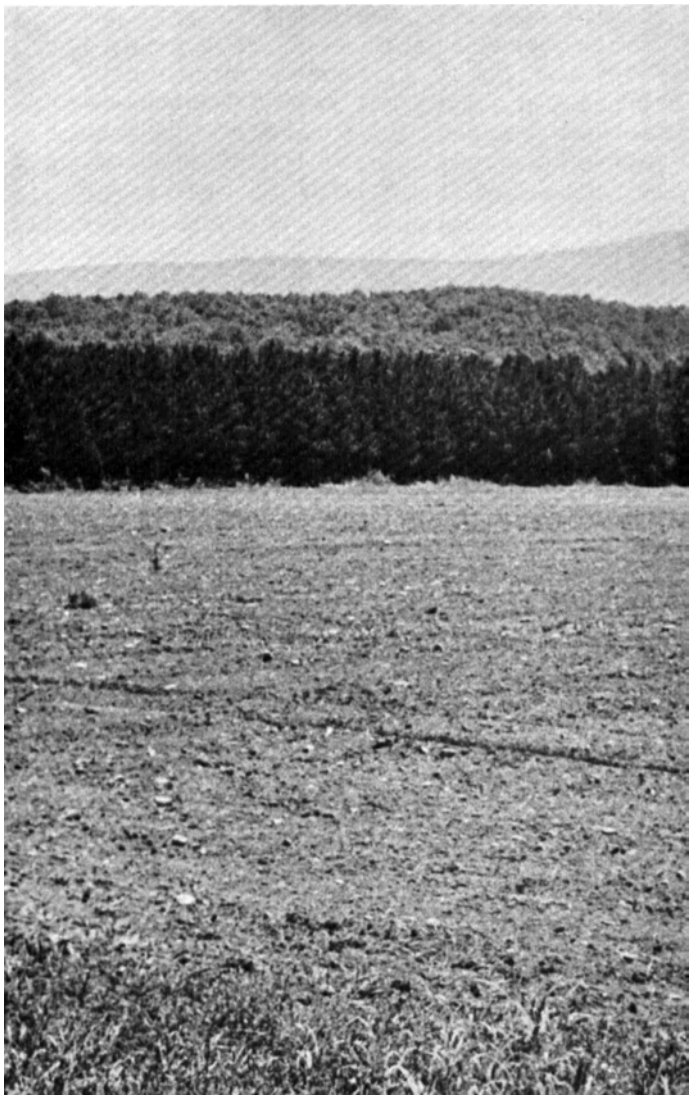

Figure 4.—Lily loam, 2 to 7 percent slopes. This soil, on the Cumberland Plateau, is well suited to vegetables.

Moderate depth to bedrock is a severe limitation for subsurface sewage disposal systems and the construction of basements.

The soil is in capability subclass IIe and woodland subclass 4o.

LlD—Lily loam, 12 to 20 percent slopes. This well drained, moderately deep, moderately steep soil is on the ridges and upper side slopes of the White Oak, Grindstone, and Cumberland Mountains. Slopes are smooth and convex. Individual areas range from 2 to 25 acres.

Typically, the surface layer is dark grayish brown and pale brown loam about 6 inches thick. The subsoil is yellowish brown loam in the upper part. Below this is yellowish brown clay loam and sandy clay loam that extends to bedrock at about 37 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately rapid, and the available water capacity is moderate. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is moderately deep.

Included with this soil in mapping are soils that have a silt loam surface layer and are deeper over bedrock.

This soil is used mostly for woodland and pasture.

This soil is moderately suited to cultivated crops. It is well suited to pasture and hay crops. Slope and a moderately deep root zone are limitations. Natural fertility is low, but this soil responds well to fertilization. Erosion is a hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland. Productivity is limited by the moderate available water capacity and low natural fertility. This soil has no significant limitations to woodland use and management. Trees which grow on this soil include loblolly pine, shortleaf pine, and Virginia pine.

This soil is moderately suited to most urban uses. Moderate depth to bedrock and slope are limitations. Depth to bedrock is a severe limitation for subsurface sewage disposal systems and the construction of basements.

This soil is in capability subclass IVe and woodland subclass 4r.

LnB—Lonewood silt loam, 2 to 6 percent slopes. This deep, well drained, gently sloping soil is on broad plateaus and ridgetops. Slopes are normally smooth and convex. Individual areas range from 3 to 100 acres.

Typically, the surface layer is very dark grayish brown silt loam about 9 inches thick. The subsoil extends to a depth of about 65 inches. It is yellowish brown silt loam in the upper part and yellowish red silty clay loam in the lower part. The underlying material is mottled in shades of brown and red. Hard shale bedrock is at a depth of 70 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. This soil has moderate permeability and high available water capacity. It has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by plant roots.

Included with this soil in mapping are small areas of Lily and Ramsey soils near the break to steeper slopes. Lily soils range from 20 to 40 inches deep to bedrock, and Ramsey soils are less than 20 inches deep to bedrock. Also included are some small areas which have slopes greater than 6 percent.

Most of the acreage of this soil is in woodland. Some areas have been cleared and are used for row crops, hay, and pasture.

This soil is well suited to row crops, hay, and pasture. Erosion is a hazard if row crops are grown.

This soil is well suited to woodland. Trees which grow on this soil are white oak, loblolly pine, and shortleaf pine. This soil has no significant limitations to woodland use and management.

This soil is well suited to most urban uses. There are no significant limitations which cannot be overcome by good design and construction.

This soil is in capability subclass IIe and woodland subclass 3o.

Lo—Lobelville cherty silt loam. This deep, moderately well drained, nearly level cherty soil is along streams and foot slopes. It formed in thick deposits of cherty alluvium. Slopes are commonly less than 2 percent. Individual areas range from 2 to 5 acres.

Typically, the surface layer is brown cherty silt loam about 10 inches thick. The subsoil is brown cherty silt loam which has gray mottles and extends to a depth of 45 inches. The underlying material is gray very cherty silt loam that extends to a depth of 62 inches or more.

This soil is low in natural fertility and organic matter content. It is strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. This soil has a seasonal high water table at a depth of 2 to 3 feet in winter and spring. It is flooded occasionally.

Included with this soil in mapping are small areas of Ennis soils that are well drained and small areas of Roane soils that have a fragipan.

Most areas of this soil have been cleared and are used for cultivated crops, hay, and pasture. A few small areas are still in woodland, and some areas are idle.

This soil is well suited to farming. Most cultivated crops, hay, and pasture grow well on this soil. The chert content, high water table, and occasional flooding are moderate limitations for cultivated crops.

This soil is well suited to use as woodland. Occasional flooding and wetness are moderate limitations to the use

of equipment. Trees that grow on this soil include yellow-poplar, black walnut, and white oak.

This soil is poorly suited to most urban uses. Flooding and the high water table are severe limitations.

This soil is in capability subclass IIw and woodland subclass 2w.

MnB—Minvale cherty silt loam, 3 to 12 percent slopes. This deep, well drained, gently sloping to sloping soil is on foot slopes and benches. Slopes are smooth and convex. They range from 3 to 12 percent but are dominantly 3 to 7 percent. Individual areas range from 2 to 15 acres.

Typically, the surface layer is grayish brown and yellowish brown cherty silt loam about 6 inches thick. The subsoil is strong brown cherty silt loam in the upper part and yellowish red cherty silty clay loam in the middle and lower parts.

This soil is low in natural fertility and organic matter. It is strongly acid or very strongly acid, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep.

Included with this soil in mapping are small areas of Fullerton soils which have a red clayey subsoil.

Most of the acreage of this soil has been cleared and is used for cultivated crops, hay, and pasture. A few small areas near steep hillsides are still in woodland.

This soil is well suited to farming. Corn, small grain, hay, and pasture grasses grow well on this soil (fig. 5). Erosion is a hazard if cultivated crops are grown.

This soil is well suited to woodland. The deep root zone and high available water capacity favor good growth. This soil has no significant limitations to woodland use or management. Trees which grow well on this soil include yellow-poplar, white oak, and black walnut.

This soil is well suited to most urban uses. It has no significant limitations to urban uses.

This soil is in capability subclass IIe and woodland subclass 3o.

MnD—Minvale cherty silt loam, 12 to 20 percent slopes. This deep, well drained, moderately steep soil is on the side slopes of cherty limestone ridges. Slopes are

Figure 5.—Minvale cherty silt loam, 3 to 12 percent slopes, is well suited to cropland and pasture. Fullerton soils are in the background.

short, smooth, and convex. Individual areas range from 2 to 10 acres.

Typically, the surface layer is grayish brown and yellowish brown cherty silt loam about 6 inches thick. The subsoil is strong brown cherty silt loam in the upper part and yellowish red cherty silty clay loam in the middle and lower parts.

This soil is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. Tilth is good and the root zone is deep.

Included with this soil in mapping are small areas of Fullerton soils which have a red cherty clay subsoil and soils that do not have fragments of chert in the surface layer.

This soil is used for cultivated crops, hay, and pasture. Small areas near steep hillsides are in woodland.

This soil is moderately suited to farming. Hay and pasture grasses are well suited. Erosion is a severe hazard if cultivated crops are grown.

This soil is well suited to use as woodland. Trees which grow on this soil include yellow-poplar, white oak, and black walnut. This soil has no significant limitations to woodland management.

This soil is moderately suited to most urban uses. Slope is a limitation, but it can be overcome by good engineering design.

This soil is in capability subclass IVe and woodland subclass 3o.

MoE—Montevallo shaly silt loam, 20 to 45 percent slopes. This shallow, well drained, steep soil is on side slopes of ridges. Slopes are normally long and convex. Individual areas range from 5 to 25 acres.

Typically, the surface layer is dark grayish brown shaly silt loam about 6 inches thick. The subsoil is light yellowish brown very shaly silt loam. Rippable shale is at a depth of 18 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid. Permeability is moderate, and the available water capacity is very low. Tilth is poor because of the volume of shale fragments. The root zone is shallow.

Included with this soil in mapping are soils that have a shaly silty clay subsoil and are more than 20 inches to shale bedrock.

Most of the acreage is used for woodland. The soil is poorly suited to woodland. A shallow root zone, slope, and very low available water capacity are the most limiting soil properties. Slope limits the use of equipment and machinery. Trees which grow on this soil include loblolly pine and Virginia pine.

This soil is poorly suited to cultivated crops, hay, and pasture. Steep slopes, a shallow root zone, and very low available water capacity are limitations. Erosion is a hazard if vegetation is not maintained.

This soil is poorly suited to most urban uses. Steep slopes and the shallowness to bedrock are severe limitations. Driveways and roads are difficult to construct and maintain.

This soil is in capability subclass VIIe and woodland subclass 4d.

Ne—Newark silt loam. This deep, somewhat poorly drained, nearly level soil is on flood plains and in depressions. Slopes are commonly less than 2 percent, but range up to 3 percent. Individual areas range from 2 to 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 6 inches thick. The subsoil extends to a depth of 30 inches. In the upper part it is brown and grayish brown silt loam that has gray mottles, and in the lower part it is gray silt loam. The underlying material is gray silt loam and loam to a depth of 60 inches or more.

This soil is medium in natural fertility and organic matter. It is slightly acid to mildly alkaline. Permeability is moderate, and runoff is slow. The available water capacity is high. The water table is near the surface in winter and spring. This soil is subject to occasional flooding.

This soil is mostly used for row crops, woodland, and pasture. Most areas used for cropland have been drained.

This soil is well suited to farming. Flooding and wetness are moderate limitations. Flooding may cause some crop damage during periods of heavy rainfall.

This soil is well suited to trees that grow on soils which are seasonally wet. Wetness moderately limits the use of equipment. Trees which grow on this soil include red maple, sweetgum, American sycamore, eastern cottonwood, and loblolly pine.

This soil is poorly suited to urban use because of wetness and occasional flooding. These limitations are difficult to overcome.

This soil is in capability subclass IIw and woodland subclass 2w.

NsB—Nesbitt silt loam, 2 to 6 percent slopes. This deep, moderately well drained, gently sloping soil is on foot slopes, terraces, and upland flats. Slopes are smooth and slightly concave. Individual areas range from 2 to 10 acres.

Typically, the surface layer is brown silt loam about 9 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish brown silt loam or silty clay loam in the upper part and light yellowish brown silty clay in the lower part. The subsoil is mottled in shades of gray and brown below the upper 10 to 15 inches.

Included with this soil in mapping are small areas of a soil that has a compact, slowly permeable fragipan in the subsoil. Also included are a few small areas where the soil is less than 60 inches deep to bedrock.

This soil is low in natural fertility and organic matter content. It ranges from medium acid to strongly acid, except in areas where the surface layer has recently been limed. Permeability is moderate in the upper 2 1/2 to 3 feet of this soil and moderately slow below this depth. This soil has a seasonal high water table at a depth of 2 to 3 feet. The available water capacity is high.

This soil is used mostly for cultivated crops, hay, and pasture. In some areas it is used as woodland.

This soil is well suited to farming. Because it occurs as small areas adjacent to steeper soils, however, the use of most farm equipment is difficult. Erosion is a moderate hazard if row crops are grown. Seasonal wetness may delay early planting of row crops in some years. This soil is suited to most locally adapted grasses and legumes. It is not well suited to alfalfa because of the seasonal high water table.

This soil is well suited to woodland. Trees that grow on this soil include yellow-poplar, white oak, southern red oak, sweetgum, loblolly pine, and eastern white pine. This soil has no significant limitations to woodland use and management.

This soil is moderately suited to most urban uses. Moderately slow permeability and the seasonal water table are the most limiting soil features for most uses.

This soil is in capability subclass IIe and woodland subclass 3o.

Pt—Pits, quarries. This map unit consists of limestone quarries. Two areas of this map unit, each approximately 100 acres in size, are in this county. One of the areas is in the ridge and valley part of the county. It consists of a pit, about 150 feet deep, and stockpiles of crushed stone. The other area is at the base of the Cumberland Mountains. It consists of a bench excavated at the foot of the mountain and stockpiles of crushed stone. Both of these areas are active quarries.

This unit is not assigned to interpretative groups.

RaD—Ramsey loam, 8 to 25 percent slopes. This shallow, somewhat excessively drained, sloping and moderately steep soil is on slopes of the Cumberland Mountains. Individual areas range from 5 to 25 acres.

Typically, the surface layer is very dark grayish brown and brown loam about 8 inches thick. The subsoil is yellowish brown loam and sandy loam that extends to sandstone bedrock at a depth of 16 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is rapid, and the available water capacity is very low. The root zone is shallow.

Included with this soil in mapping are small areas of Ramsey soil that has a stony surface layer. Also included are small areas of Rock outcrop.

This soil is used mostly for woodland. A few small areas have been cleared and used for pasture.

This soil is poorly suited to woodland. Because of shallowness to bedrock and the very low available water capacity, seedling mortality and the windthrow hazard are severe. Trees which grow on this soil include Virginia pine, shortleaf pine, and loblolly pine.

This soil is poorly suited to farming. Cool-season grasses have fair growth. Depth to sandstone bedrock and very low available water capacity severely limit the use of this soil as cropland.

This soil is poorly suited to most urban uses. Shallowness to bedrock and slope are severe limitations for the construction of subsurface sewage disposal systems, roads, and streets.

This soil is in capability subclass VIe and woodland subclass 4d.

RcF—Ramsey-Rock outcrop complex, 15 to 70 percent slopes. This map unit consists of shallow, somewhat excessively drained, moderately steep to very steep Ramsey soils and sandstone Rock outcrop so intermingled that they could not be separated at the scale selected for mapping. This unit is on the steeper, more highly dissected parts of the Cumberland Plateau and on the upper part of the steep mountainsides. Sandstone cliffs 10 to 50 feet high are prominent in places near the break between the plateau and the mountainside. Individual areas of this unit range from 5 to 50 acres.

Ramsey soils make up from 45 to 70 percent of each mapped area, but average about 55 percent. Typically, the surface layer is very dark grayish brown and brown loam about 8 inches thick. The subsoil is yellowish brown loam. Hard sandstone bedrock is at a depth of 16 inches.

Ramsey soils are low in natural fertility and organic matter content. They are strongly acid or very strongly acid. Permeability is rapid, and the available water capacity is low or very low. The root zone is shallow over bedrock.

Rock outcrop makes up from 25 to 45 percent of each mapped area and averages about 35 percent. Areas of the exposed sandstone bedrock range from a few feet in diameter to long, narrow cliffs 10 to 50 feet high.

Included in mapping are small areas of Ramsey soil which have stones on the surface. Also included are some areas on the Cumberland Plateau where slopes are less than 15 percent and areas of Lily soil that are deeper than 20 inches to bedrock.

Practically all of this unit is used as woodland (fig. 6). These soils are poorly suited to farming, woodland, urban development, and engineering uses. Steep slopes, shallowness over bedrock, and areas of Rock outcrop are severe limitations that are very difficult to overcome for most uses.

Figure 6.—Recently cut-over area of Ramsey-Rock outcrop complex. This complex is mostly in woodland.

Woodland is generally the best use of this map unit; however, trees grow slowly. Seedling mortality and windthrow hazard are severe management problems because of the shallow root zone and droughtiness. Rock outcrops and steep slopes limit the operation of equipment. Trees that grow on this unit include Virginia pine, shortleaf pine, loblolly pine, upland oak, and hickory.

This complex is in capability subclass VIIs. The Ramsey soils are in woodland subclass 4x.

RoA—Roane cherty loam, 0 to 2 percent slopes. This nearly level, moderately well drained, cherty soil is along drainageways and on flood plains of small streams and low stream terraces. It has a slowly permeable fragipan in the subsoil at a depth of about 20 inches. Individual areas are normally long and narrow and range from about 3 to 10 acres.

Typically, the surface layer is brown cherty loam about 6 inches thick. The upper part of the subsoil is brownish yellow cherty loam. Below about 20 inches, the subsoil is light yellowish brown and very pale brown very cherty clay loam mottled in shades of brown and gray. This layer is a compact, brittle, slowly permeable fragipan that contains about 50 to 65 percent chert fragments by volume.

Included in mapping are small areas of the well

drained Ennis and moderately well drained Lobelville soils which are cherty but do not have a compact, slowly permeable fragipan in the subsoil.

This soil is low in natural fertility and organic matter content. It is strongly acid throughout, except in areas where the surface layer has recently been limed. Permeability is moderate above the fragipan and slow in the fragipan. The root zone is moderately deep, and the available water capacity is moderate to low. This soil has a perched water table at a depth of 2 to 3 feet in winter and spring. Most areas of this soil are flooded frequently.

The largest acreage of this soil is used for hay and pasture, but some areas are used for cultivated crops and woodland.

This soil is moderately suited to cultivated crops and moderately to well suited to hay and pasture. A moderately deep root zone, moderate to low available water capacity, frequent flooding, and the small size of areas are limiting features. The chert fragments in the surface layer hinder tillage.

This soil is moderately suited to woodland. The growth rate of trees is limited by root zone depth, low fertility, and moderate available water capacity. This soil has no significant limitations to woodland use and management. Trees which grow on this soil include loblolly pine, shortleaf pine, Virginia pine, and southern red oak.

This soil is poorly suited to most urban uses. Slow permeability, the seasonal high water table, chert fragments in the surface layer, and frequent flooding are severe limitations for these uses.

This soil is in capability subclass IIIw and woodland subclass 3o.

RoB—Roane cherty silt loam, 2 to 6 percent slopes. This gently sloping, moderately well drained, cherty soil is on stream terraces and foot slopes. It has a slowly permeable fragipan in the subsoil at a depth of about 20 inches. Individual areas range from about 3 to 15 acres.

Typically, the surface layer is brown cherty silt loam about 6 inches thick. The upper part of the subsoil is brownish yellow cherty silt loam. Below about 20 inches, the subsoil is light yellowish brown and very pale brown very cherty clay loam mottled in shades of brown and gray. This layer is a compact, brittle, slowly permeable fragipan that contains about 50 to 65 percent cherty fragments by volume.

Included in mapping are some areas of a well drained cherty soil that does not have a fragipan. Also included are some small areas on foot slopes where slopes are greater than 6 percent.

This soil is low in natural fertility and organic matter content. It is strongly acid throughout, except in areas where the surface layer has recently been limed. Permeability is moderate above the fragipan and slow in the fragipan. The root zone is moderately deep, and the available water capacity is moderate to low. Most areas of this soil are not subject to frequent flooding but are inundated under abnormally high flood conditions. This soil has a perched water table at a depth of 2 to 3 feet in winter and spring.

The largest acreage of this soil is used for cultivated crops, hay, and pasture, but some areas are used as woodland.

This soil is well suited to cultivated crops, hay, and pasture. The moderately deep root zone, moderate available water capacity, and the small size of individual areas adjacent to steeper soils are limiting features. The chert fragments in the surface layer hinder tillage.

This soil is well suited to use as woodland. It has no significant limitations to woodland use and management. Trees which grow on this soil include loblolly pine, shortleaf pine, Virginia pine, and southern red oak.

This soil is poorly suited to most urban uses. Slow permeability, the seasonal high water table, chert fragments in the surface layer, and rare flooding severely limit this soil for these uses.

This soil is in capability subclass IIe and woodland subclass 3o.

SeB—Sequatchie loam, 2 to 7 percent slopes. This deep, well drained, gently sloping soil is on stream terraces and alluvial fans. Slopes are smooth and mostly convex. Individual areas range from 2 to 25 acres.

Typically, the surface layer is very dark grayish brown loam about 9 inches thick. The subsoil extends to a depth of about 46 inches. It is brown loam in the upper part and yellowish brown clay loam in the lower part. The underlying material is yellowish brown loam that extends to a depth of 61 inches or more.

Included with this soil in mapping are small areas of the moderately well drained Whitwell soils on slightly lower concave areas.

This soil is medium in natural fertility and in organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be worked throughout a wide range of moisture conditions. The root zone is deep and easily penetrated by roots. Most areas of this soil are not subject to frequent flooding but are inundated under abnormally high flood conditions.

Most of the acreage is used for cultivated crops. This soil is well suited to cultivated crops, hay, and pasture. High yields can be obtained. All locally grown grain, hay, and pasture crops grow on this soil. Erosion is a hazard if cultivated crops are grown.

This soil is well suited to woodland. It has no significant limitations to woodland use or management. Trees that grow on this soil include yellow-poplar, white oak, and loblolly pine.

This soil is well suited to most urban uses. Flood records and onsite investigation are needed to determine the flood hazard in areas of this soil.

This soil is in capability subclass IIe and woodland subclass 2o.

SfB—Sequatchie-Urban land complex, 2 to 7 percent slopes. This map unit consists of areas of deep, well drained, gently sloping Sequatchie soils, Urban land, and disturbed soils. These areas are so intricately mixed or small that they could not be separated at the scale selected for mapping. This map unit ranges from about 10 to 100 acres in size, and individual areas of each component range from about 0.1 acre to about 5 acres. Sequatchie soils make up 30 to 50 percent of each mapped area. Urban land makes up 25 to 45 percent, and disturbed areas make up 10 to 20 percent.

Typically, the Sequatchie soils have a surface layer of very dark grayish brown loam about 9 inches thick. The subsoil extends to a depth of 46 inches. It is brown loam in the upper part and yellowish brown clay loam in the lower part. The underlying material is yellowish brown loam that extends to a depth of 61 inches or more.

Sequatchie soils are medium in natural fertility and organic matter content. They are strongly acid or very strongly acid, except in areas where the surface layer has recently been limed. Permeability is moderate, and the available water capacity is high. These soils have a deep root zone that is easily penetrated by plant roots.

The Urban land part of this unit is covered by buildings, streets, parking lots, sidewalks, and other structures.

The disturbed areas have been excavated during the installation of utilities and cut and filled during grading and shaping operations. They have been altered to the extent that individual soils cannot be identified and predictions cannot be made about the suitability of the soils for use without an onsite investigation.

Included with this unit in mapping are small areas of a soil which has a clayey subsoil. Also included along drainageways and in depressions are areas of the moderately well drained Whitwell soils.

The Sequatchie soils are used for parks, open space, building sites, lawns, and gardens. These soils are well suited to lawns, gardens, trees, and shrubs. They are also well suited to recreation developments, building sites, and most other engineering uses.

The Sequatchie soils are in woodland subclass 2o. They are not assigned to a suitability subclass.

SmD—Sequoia silt loam, 8 to 20 percent slopes. This moderately deep, well drained, sloping and moderately steep soil is on the ridges of the Cumberland Mountains. Slopes are short and convex. Individual areas range from 2 to 10 acres.

Typically, the surface layer is dark grayish brown silt loam about 5 inches thick. The subsoil extends to a depth of 36 inches. It is yellowish brown silty clay loam in the upper part and yellowish red silty clay and clay in the middle and lower parts. Shale underlies the subsoil.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately slow. The available water capacity is low but ranges to moderate where the soil is deepest to rock. This soil has a moderately deep root zone.

Included with this soil in mapping are small areas of a soil that has a loamy subsoil and small eroded areas that have a silty clay loam surface layer.

This soil is used mostly for woodland and pasture.

This soil is moderately suited to farming. Erosion is a severe hazard if cultivated crops are grown. The clayey subsoil, slope, and low available water capacity are limitations.

This soil is moderately suited to use as woodland. The clayey subsoil, moderately deep root zone, and the low available water capacity are limitations. Trees which grow on this soil include northern red oak, shortleaf pine, and Virginia pine.

This soil is poorly suited to most urban uses. The slope, depth to bedrock, and clayey subsoil are limitations.

This soil is in capability subclass VIe and woodland subclass 3o.

Sn—Sewanee Variant silt loam. This moderately deep, moderately well drained, nearly level and gently sloping soil is along drainageways and in depressions on the Cumberland Plateau. Individual areas range from about 2 to 10 acres. Slopes range from 0 to 3 percent.

Typically, the surface layer is dark grayish brown and light yellowish brown silt loam about 7 inches thick. The subsoil is light yellowish brown and yellowish brown silt loam. It is mottled in shades of brown and gray below a depth of about 12 inches. Sandstone bedrock is at a depth of about 28 inches.

Included in mapping are small areas of a soil which is deeper than 40 inches to bedrock and has a compact, slowly permeable layer in the subsoil.

This soil is low in natural fertility and organic matter content. It is strongly acid or very strongly acid throughout, except in areas where the surface layer has recently been limed. Both the permeability and the available water capacity are moderate. The root zone is moderately deep over sandstone bedrock. This soil is flooded occasionally.

This soil is used mostly as woodland or pasture.

This soil is moderately suited to farming. Row crops produce moderate yields, but the small size of soil areas, flooding, and seasonal wetness limit the use of this soil

for row crops. Cool-season grasses and legumes grow well on this soil.

This soil is moderately suited to use as woodland. Tree growth is moderate because of low fertility and moderate available water capacity. Wetness limits the use of equipment during the winter and early spring, but this soil has no other significant limitations to woodland management. Trees that grow on this soil include yellow-poplar, eastern white pine, and shortleaf pine.

This soil is poorly suited to most urban uses. Depth to bedrock, the seasonal high water table, and flooding are severe limitations for most urban uses.

This soil is in capability subclass IIw and woodland subclass 3w.

St—Staser loam. This deep, well drained, nearly level soil is on flood plains. Slopes are normally smooth and long, and range from 0 to 3 percent. Individual areas range from 2 to 10 acres.

Typically, the surface layer is very dark grayish brown and dark brown loam about 30 inches thick. The subsoil is dark yellowish brown loam that extends to a depth of 60 inches or more.

This soil is high in natural fertility and medium in organic matter content. It is slightly acid to mildly alkaline. Permeability is moderate, and the available water capacity is high. The soil has good tilth and can be worked throughout a wide range of moisture content. The root zone is deep and easily penetrated by roots.

Included with this soil in mapping are small areas of a soil that is moderately well drained. Also included are areas of a soil which contains less clay and small areas at the base of the Cumberland Mountains where the soil is more acid.

Most of the acreage is used for cultivated crops and pasture. This soil is well suited to farming. High yields are easily obtained. Erosion is not a hazard. Occasional flooding is a limitation during periods of heavy rainfall.

This soil is well suited to woodland. It has no significant limitations to woodland management. Trees which grow on this soil include black walnut, yellow-poplar, and loblolly pine.

This soil is poorly suited to most urban uses because of the occasional flooding.

This soil is in capability subclass IIw and woodland subclass 2o.

TaC—Talbott silt loam, 2 to 12 percent slopes. This moderately deep, well drained, gently sloping to sloping soil is on limestone uplands. Slopes are smooth and convex. Individual areas range from 2 to 20 acres.

Typically, the surface layer is yellowish brown silt loam 6 inches thick. The subsoil is yellowish red clay in the upper part and yellowish brown clay in the lower part. The lower part of the subsoil is mottled in shades of yellow, brown, and red. The subsoil extends to limestone bedrock at a depth of 36 inches.

This soil is medium acid or strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is moderate. The shrink-swell potential is moderate. The root zone is moderately deep.

Included with this soil in mapping are small areas of soils that are moderately well drained. They have yellower hues in the subsoil and gray mottles below the upper 10 inches. Also included are soils that have a thicker surface layer and subsoil and are deeper to bedrock and a few eroded areas where the surface layer is clayey.

This soil is used for hay and pasture. A small acreage next to rocky areas is still in woodland.

This soil is moderately suited to hay and pasture and poorly suited to row crops. Cool-season grasses and legumes grow best on this soil. The moderate depth of the root zone, droughtiness, and high clay content in the subsoil are limitations.

This soil is moderately suited to use as woodland. The clayey subsoil, moderate available water capacity, and moderate depth of the root zone are limitations. Trees which grow on this soil include loblolly pine and shortleaf pine.

This soil is poorly suited to most urban uses. Moderately slow permeability, moderate shrink-swell potential, and moderate depth to rock are limitations.

This soil is in capability subclass IVe and woodland subclass 3c.

TaD—Talbott silt loam, 12 to 25 percent slopes. This moderately deep, well drained, moderately steep soil is on limestone uplands. Slopes are smooth and convex. Individual areas range from 2 to 15 acres.

Typically, the surface layer is yellowish brown silt loam 6 inches thick. The subsoil is yellowish red clay in the upper part and yellowish brown clay in the lower part. The lower part of the subsoil is mottled in shades of yellow, brown, and red. Limestone bedrock is at a depth of 36 inches.

This soil is low in natural fertility and organic matter content. It is strongly acid or medium acid throughout except in areas where the surface layer has been limed. Permeability is moderately slow, and the available water capacity is moderate. The root zone is moderately deep.

Included with this soil in mapping are small areas of a soil that is moderately well drained and has a brown subsoil with gray mottles. Also included are small eroded areas where the surface layer is clayey.

This soil is used mostly for hay and pasture. A few small areas are still in woodland.

This soil is moderately suited to hay and pasture. The clayey subsoil, slope, moderate available water capacity, and moderately deep root zone are limitations. This soil is poorly suited to row crops because of the severe hazard of erosion and low productivity.

This soil is moderately suited to use as woodland. The

clayey subsoil, moderate available water capacity, and moderately deep root zone are limitations. Trees which grow on this soil include northern red oak, eastern redcedar, loblolly pine, and shortleaf pine.

This soil is poorly suited to most urban uses. Moderately slow permeability, moderate shrink-swell potential, slope, and moderate depth to rock are limitations.

This soil is in capability subclass VIe and woodland subclass 3c.

TrD—Talbott-Rock outcrop complex, 5 to 25 percent slopes. This map unit consists of areas of well drained, sloping to moderately steep Talbott soils and limestone Rock outcrop so intermingled that they could not be separated at the scale selected for mapping. Talbott soils make up 40 to 65 percent of each area and average about 50 percent. Rock outcrop makes up 25 to 45 percent of each mapped area and averages about 35 percent.

Typically, the surface layer of the Talbott soils is yellowish brown silt loam about 6 inches thick. The subsoil is yellowish red clay. Limestone bedrock is at a depth of about 36 inches.

The Talbott soils are low in natural fertility and organic matter content. They are medium acid or strongly acid. Permeability is moderately slow, and the available water capacity is moderate.

Rock outcrop is limestone bedrock that commonly occurs as narrow ledges parallel to the slope. The outcrops range in height from about 1/2 foot to 3 feet.

Included with this unit in mapping are small areas of Colbert soil which has a yellowish brown subsoil that is more than 60 percent clay.

This unit is poorly suited to farming, woodland, and urban use. Rock outcrop, high clay content, and moderate depth over limestone bedrock are limitations.

The Talbott soils are in capability subclass VIs and woodland subclass 3c.

Tu—Tupelo silt loam. This deep, somewhat poorly drained, nearly level and gently sloping soil is on stream terraces and foot slopes of ridges and in depressions on the uplands. Slopes range from 0 to about 3 percent. Individual areas range from 2 tp 10 acres.

Typically, the surface layer is yellowish brown silt loam about 8 inches thick. The subsoil extends to a depth of about 48 inches. In the upper part it is yellowish brown silt loam and light olive brown silty clay mottled in shades of brown and gray. In the lower part it is pale olive and light brownish gray clay mottled in shades of brown and gray. The underlying material is gray clay that extends to a depth of 60 inches or more.

This soil is low in natural fertility and organic matter content. It ranges from slightly acid to strongly acid throughout. Permeability is slow, and the available water capacity is moderate. The clayey subsoil restricts the movement of air and water and the growth of plant roots. A high water table is present in winter and early spring. This soil is flooded occasionally.

Included with this soil in mapping are areas of a soil that is well drained. Also included are a few small areas that have up to 1 foot of loamy alluvium on the surface.

This soil is used mostly for woodland and pasture. Cultivated crops are grown on some areas that are adequately drained (fig. 7).

This soil is moderately suited to cultivated crops. Wetness, occasional flooding, and the plastic, clayey subsoil are limitations. This soil is moderately to well suited to pasture and hay.

This soil is moderately suited to use as woodland. Wetness, occasional flooding, and slow surface runoff are limitations. Trees that grow on this soil include sweetgum, loblolly pine, and willow oak.

This soil is poorly suited to most urban uses. Wetness, flooding, slow surface runoff, high shrink-swell potential, and low strength are limitations.

This soil is in capability subclass IIIw and woodland subclass 3w.

UPF—Udorthents and Pits, steep. This unit consists primarily of pits and mine spoil from coal mining. The pits vary from 25 to 200 feet in width and from 25 to 100 feet in depth and are several hundred feet long. They make up about 50 percent of the area. Udorthents make up the spoil piles, which range in height from 50 to 200 feet. The spoil makes up about 50 percent of the area. It is fragments of sandstone and shale and fine earth that weathered mostly from the shale. Rock fragments make up 35 to 75 percent by volume of the spoil. Most of the natural soil has been buried. Reaction in the spoil is very strongly acid or extremely acid. Slopes of the spoil dumps range from about 20 to 60 percent.

This unit is poorly suited to farming, woodland, and urban uses. The steep slopes, fragments of rock, low fertility, acidity, and low available water capacity are limitations for most uses.

This complex is in capability subclass VIIs.

Ur—Urban land. This map unit is in the inner city of Chattanooga, where buildings, streets, parking lots, sidewalks, and other structures cover 85 percent or more of the land. There are no identifiable soils in this unit. There are some small open areas that are not covered by structures, but the soils in these areas have been altered by the installation of utilities and excavation for buildings, streets, and other structures. Evaluation of this unit for any specific use requires onsite investigation.

WaB—Waynesboro loam, 2 to 8 percent slopes. This deep, well drained, gently sloping soil is on high stream terraces. It formed in alluvium ranging from 4 to 10 feet thick. It is underlain by residuum of limestone or

Figure 7.—Pasture on Tupelo silt loam. Some areas of this soil which are adequately drained are used for cultivated crops.

shale. Slopes are smooth and convex. Individual areas range from 2 to 20 acres.

Typically, the surface layer is brown loam about 3 inches thick. The subsoil extends to a depth of 64 inches or more. It is yellowish red loam and clay loam in the upper part and red clay in the middle and lower parts.

This soil is strongly acid throughout, except in areas where the surface layer has been limed. Permeability of this soil is moderate, and the available water capacity is high. The soil has good tilth and can be cultivated over a wide range of moisture conditions. The root zone is deep.

Included with this soil in mapping are areas of a soil that has more than 15 percent fragments of chert in the subsoil. Also included are areas of Etowah soil, which has a dark brown surface layer and a red loamy subsoil.

This soil is used mostly for hay, pasture, and cultivated crops.

This soil is well suited to farming (fig. 8). It is well suited to all locally grown hay, pasture, and grain crops. Erosion is a hazard if cultivated crops are grown.

This soil is well suited to woodland. It has no significant limitations to woodland use or management. Trees which grow on this soil include yellow-poplar, white oak, and Virginia pine.

This soil is well suited to most urban uses. There are no significant limitations that cannot be overcome by good design and construction.

This soil is in capability subclass IIe and woodland subclass 3o.

WaD—Waynesboro loam, 12 to 25 percent slopes. This deep, well drained, moderately steep soil is on high stream terraces. Slopes are smooth and convex. Individual areas range from 2 to 30 acres.

Typically, the surface layer is dark brown loam about 3 inches thick. The subsoil extends to a depth of 60 inches or more. It is yellowish red loam and clay loam in the upper part and red clay in the middle and lower parts.

This soil is strongly acid throughout except in areas where the surface layer has been limed. Permeability is moderate, and the available water capacity is high. This soil has good tilth and can be cultivated over a wide range of moisture conditions. The root zone is deep.

Included with this soil in mapping are areas of a soil that contains more than 15 percent chert in the subsoil and areas of Etowah soils, which have a loamy subsoil. Also included are small, severely eroded areas that have a clay loam surface layer.

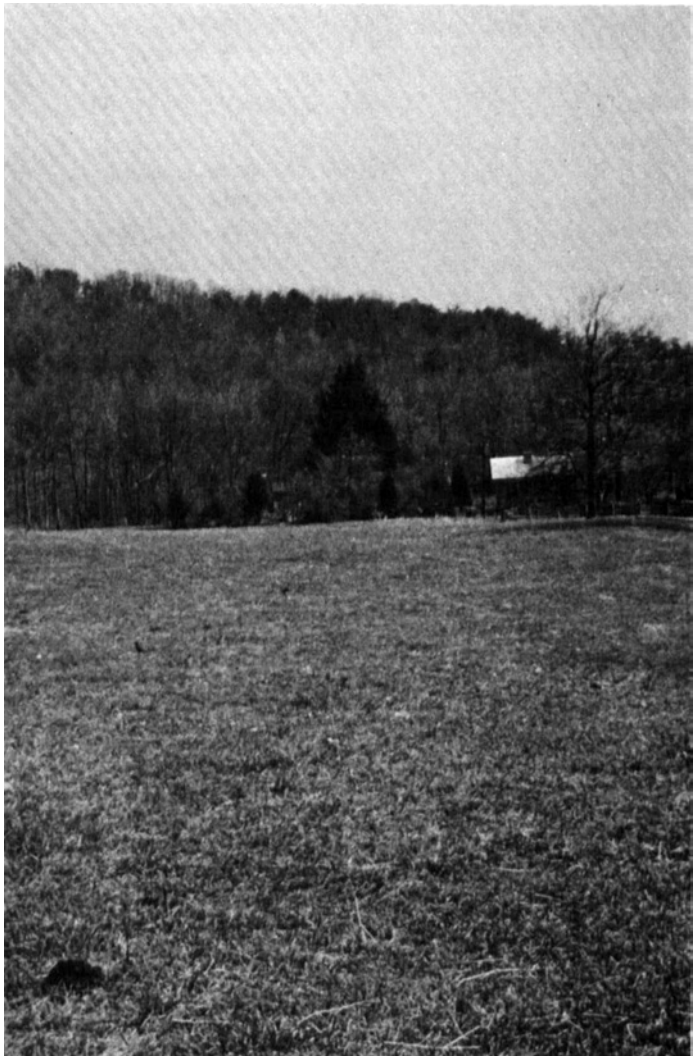

Figure 8.—Pasture on Waynesboro loam, 2 to 8 percent slopes. This is prime farmland.

This soil is used mainly for pasture.

This soil is moderately suited to cultivated crops. Slope limits the use of equipment. Erosion is a severe hazard if row crops are grown.

This soil is well suited to most pasture and hay crops. High yields can be obtained by the use of good management practices.

This soil is well suited to woodland. It has no significant limitations to woodland use and management. Trees which grow on this soil include loblolly pine, shortleaf pine, and Virginia pine.

This soil is poorly suited to most urban uses. Slope is a limitation, but it can be partly overcome by good design and construction.

This soil is in capability subclass IVe and woodland subclass 3o.

WeB—Welchland cobbly loam, 2 to 7 percent slopes. This deep, well drained, gently sloping cobbly soil formed in local alluvium on alluvial fans (fig. 9). Slopes are smooth and convex. Individual areas range from 5 to 20 acres.

Typically, the surface layer is dark yellowish brown cobbly loam about 6 inches thick. The subsoil, which is 43 inches thick, is strong brown cobbly loam and cobbly clay loam. The substratum is yellowish brown cobbly sandy loam about 17 inches thick. The depth to bedrock is more than 60 inches.

This soil is strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderately rapid. The available water capacity is moderate. This soil has fair tilth and a deep root zone. It is subject to rare flooding.

Included with this soil in mapping are small areas of a soil that has less than 15 percent by volume cobblestones in the surface layer and some areas of soils that have stones larger than 10 inches across on the surface. Also included are areas of a soil that has a clayey subsoil in redder hues.

This soil is used mostly for woodland. A few areas have been cleared and are used for pasture.

This soil is moderately suited to pasture and moderately to poorly suited to row crops. Suitability is limited by rock fragments and moderate available water capacity. The cobblestones interfere with the tillage of row crops. Erosion is a hazard if cultivated crops are grown.

This soil is moderately suited to use as woodland. The moderate to low available water capacity is a limitation. The cobblestones and pebbles cause seedling mortality and limit the use of equipment. Trees that grow on this soil include loblolly pine, shortleaf pine, and Virginia pine.

This soil is poorly suited to most urban uses. Cobblestones and rare flooding are limitations to these uses.

This soil is in capability subclass IIIs and woodland subclass 3x.

Wh—Whitwell loam. This deep, moderately well drained, nearly level soil is on stream terraces. Slopes are smooth, flat, or slightly concave and range from 1 to 3 percent. Individual areas range from 2 to 15 acres.

Typically, the surface layer is brown loam about 6 inches thick. The subsoil, which is mottled in shades of brown and gray, is about 42 inches thick. It is yellowish brown loam in the upper part, strong brown clay loam in the middle part, and yellowish brown loam in the lower part. The substratum is yellowish brown loam about 12 inches thick and is mottled in shades of gray.

This soil is strongly acid throughout, except in areas where the surface layer has been limed. Permeability is moderate and the available water capacity is high. Most areas of this soil are flooded occasionally during winter and spring, but some of the higher areas are not subject

Figure 9.—Area of Welchland cobbly loam, 2 to 7 percent slopes, at the foot of the Cumberland Mountains.

to flooding. This soil has good tilth and a deep root zone. The water table is at a depth of 2 to 3 feet in winter and early spring.

Included with this soil in mapping are small areas of a soil that is well drained and has a dark colored surface layer and small areas of a moderately well drained soil that has a clayey subsoil.

This soil is used mostly for woodland and pasture. A few areas are used for row crops.

This soil is well suited to farming. Occasional flooding and wetness delay the planting of cultivated crops in some years. This soil is well suited to grasses and legumes. It is not well suited to alfalfa because of the seasonal high water table.

This soil is well suited to use as woodland. Flooding and wetness are moderate limitations to woodland management. Trees that grow on this soil include sweetgum, yellow-poplar, and northern red oak.

This soil is poorly suited to urban uses. Wetness and occasional flooding are limitations.

This soil is in capability subclass IIw and woodland subclass 2w.

Wo—Woodmont silt loam. This deep, nearly level, somewhat poorly drained soil is on upland flats and stream terraces. Slopes range from 0 to 2 percent and are smooth and slightly concave in most areas.

Individual areas range from 2 to 10 acres.

Typically, the surface layer is brown silt loam about 5 inches thick. The subsoil extends to a depth of 60 inches or more. The upper part is yellowish brown and light yellowish brown silt loam which has gray mottles. The middle and lower parts are a mottled gray and brown silt loam fragipan. The fragipan is compact and brittle.

Included with this soil in mapping are small areas of Nesbitt and Tupelo soils. Nesbitt soils are on slightly higher positions, are moderately well drained, and do not have a fragipan. Tupelo soils are on similar positions and have the same drainage as the Woodmont soil but have a clayey subsoil.

This soil is low in natural fertility and organic matter content. It is strongly acid, except in the lower part of the subsoil, which ranges from strongly acid to slightly acid. Permeability is slow, and the available water capacity is moderate. The root zone is moderately deep because the compact fragipan retards root growth and water movement. This soil has a perched water table above the fragipan during winter and spring.

This soil is used mostly for woodland and pasture.

This soil is moderately suited to most row crops and is moderately to well suited to hay and pasture. The best row crop to grow on this soil is soybeans, which can be planted later than most crops. Water-tolerant grasses and legumes, such as tall fescue and ladino clover, are best to plant for hay and pasture.

This soil is moderately suited to woodland. A seasonal high water table moderately limits the use of equipment and causes seedling mortality. Trees that grow on this soil include yellow-poplar, willow oak, sweetgum, loblolly pine, and shortleaf pine.

This soil is poorly suited to most urban uses. The high water table and the slowly permeable subsoil are the major limitations.

This soil is in capability subclass IIIw and woodland subclass 3w.

prime farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in providing the Nation's short- and long-range needs for food and fiber. The acreage of high quality farmland is limited and the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, must encourage and facilitate the use of our Nation's prime farmland with wisdom and foresight.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland may now be in crops, pasture, woodland, or other land, but not urban and built-up land or water areas. It must either be used for producing food or fiber or be available for these uses.

Prime farmland usually has an adequate and dependable supply of moisture from precipitation or irrigation. It also has favorable temperature and growing season and acceptable acidity or alkalinity. It has few or no rocks and is permeable to water and air. Prime farmland is not excessively erodible or saturated with water for long periods and is not frequently flooded or is flooded less than once in 2 years during the growing season. The slope ranges mainly from 0 to 6 percent, but is slightly steeper for some soils. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

About 103,000 acres, or 29 percent of Hamilton County, meets the soil requirements for prime farmland. Areas of prime farmland are scattered throughout the county.

The land use trend for the past several years has been the loss of prime farmland to urban and industrial uses. The loss of prime farmland to other uses results in more intensive use of marginal land, which generally is more erodible, droughty, and difficult to cultivate. Most of the marginal land is also less productive.

Soil map units that make up prime farmland in Hamilton County are listed in this section. This list does not constitute a recommendation for a particular land use. The extent of each map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described in the section "Detailed soil map units."

Soils that have the limitations of a high water table or flooding qualify as prime farmland if these limitations are overcome by drainage or flood control. Some map units listed include a few areas that are too steep to be classed as prime farmland. In the following list, these limitations are shown in parentheses after the map unit name. Onsite evaluation is necessary to determine if these limitations have been overcome by corrective measures.

The map units that meet the requirements for prime farmland are:

CaB—Capshaw silt loam, 2 to 6 percent slopes
CrB—Crossville loam, 2 to 5 percent slopes
DeB—Dewey silt loam, 2 to 6 percent slopes
Ec—Emory silt loam
En—Ennis cherty silt loam
EtB—Etowah silt loam, 2 to 5 percent slopes
FuB—Fullerton cherty silt loam, 3 to 7 percent slopes
Ha—Hamblen silt loam
HoB—Holston loam, 2 to 6 percent slopes
HuB—Humphreys cherty silt loam, 1 to 6 percent slopes
LiB—Lily loam, 2 to 7 percent slopes
LnB—Lonewood silt loam, 2 to 6 percent slopes
Lo—Lobelville cherty silt loam
MnB—Minvale cherty silt loam, 3 to 12 percent slopes (only where the slope is less than 6 percent)
Ne—Newark silt loam (if drained)
NsB—Nesbitt silt loam, 2 to 6 percent slopes
RoB—Roane cherty silt loam, 2 to 6 percent slopes
SeB—Sequatchie loam, 2 to 7 percent slopes
Sn—Sewanee Variant silt loam (if flooded less than once in 2 years during the growing season)
St—Staser loam
Tu—Tupelo silt loam (if drained)
WaB—Waynesboro loam, 2 to 8 percent slopes
Wo—Woodmont silt loam (if drained)

use and management of the soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as rangeland and woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

crops and pasture

C.H. Jent, agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed soil map units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

The kind of management system needed is determined by the kind of soil and the crops to be grown. A good management system provides for adequate cover and other conservation measures to protect the soil from excessive erosion. It also conserves moisture, maintains soil tilth, and provides for the control of weeds, insects, and plant diseases. In most cases it also improves water quality by reducing sedimentation.

Contour farming, stripcropping, minimum-tillage or no-till, grass waterways, terraces, and diversions for water management are effective in erosion control, moisture conservation, and water quality improvement when incorporated into a cropping system. Adding organic material such as green manure crops, manure, and crop residue helps maintain soil tilth, conserves moisture, and adds plant nutrients.

The use of commercial fertilizers and lime should be based on the results of soil tests and on the nutrient requirements of the crop to be grown. The type of soil, yield level desired, and cropping practices for the last 3 to 5 years should also be considered. Information about soil test and fertilizer recommendations can be obtained from the local office of the Soil Conservation Service or the Cooperative Agricultural Extension Service.

The 1974 Census of Agriculture shows that 9,352 acres of cropland was harvested in 1974. Of this, about 7,300 acres was hay crops and about 1,600 acres was corn. Only a small acreage of other crops, including small grain, soybeans, and vegetables was grown. The acreage of vegetable crops is increasing as the fresh market demand increases and the total cropland acreage decreases.

In 1974, 22,441 acres was used for pasture. Pasture and hayland consist of both cool-season and warm-season grasses and legumes. The main grasses are tall fescue and orchardgrass. The most common legumes are white clover, red clover, crimson clover, annual lespedeza, and sericea lespedeza. Legumes are included as part of the seed mixture for establishing pastures and

are reintroduced in perennial grass stands when they make up less than about 30 percent of the pasture composition.

The major management practices needed on pastures are fertilization, weed control, rotational grazing, and occasional renovation. Fertilizer should be applied according to plant needs as indicated by their growth, the level of production desired, and the results of soil testing. Weeds can be controlled in pastures by the use of herbicides and by mowing before the weeds reach maturity and produce seed. Weed control is less of a problem on well managed pastures than it is on overgrazed, poorly managed pastures.

Some annual grasses are used for supplemental grazing or for hay. Sudan X sorghum crosses, pearl millets, and sudangrass make good summer pasture. Small grain and annual ryegrass provide good late fall and early spring grazing.

Most hay harvested is surplus growth of grass-legume pastures. Annual lespedezas, sericea lespedeza, alfalfa, and the small grains are also used for hay crops. Most hay crops yield between 1.5 and 3 tons per acre. Management for hay is generally the same as for pasture. Hay crops should be cut at the stage of growth that provides the best quality feed and does not damage the grass-legume stand. Cutting perennial hay crops too close causes premature loss of the stand.

yields per acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green-manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils.

land capability classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor does it consider possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use. No class V soils are recognized in Hamilton County.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. No class VIII soils are recognized in Hamilton County.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w,* or *s,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation

(in some soils the wetness can be partly corrected by artificial drainage); and *s* shows that the soil is limited mainly because it is shallow, droughty, or stony.

In class I there are no subclasses because the soils of this class have few limitations. The capability classification of each map unit is given in the section "Detailed soil map units."

woodland management and productivity

Joseph H. Paugh, forester, Soil Conservation Service, helped prepare this section.

Hamilton County was originally completely forested. Forests now cover about 51 percent of the land area.

The oak-hickory-pine forest type makes up most of the forested area. The part of the county that is in the Cumberland Plateau and Mountains Major Land Resource Area supports mostly oaks and hickories. Some areas of shortleaf pine mixed with oaks and hickories also are found there. Eastern hemlock is prevalent in the deep gorges and moist coves of the mountainsides. In the Southern Appalachian Ridges and Valleys Area, oak, hickory, and Virginia pine are dominant. Other tree species common throughout the county are yellow-poplar, maple, ash, sycamore, and sweetgum.

Wood products make a valuable contribution to the county's economy, although production is well below potential. Hamilton County's forests also provide recreation, wildlife habitat, natural beauty, erosion control, and watershed protection.

Table 6 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination (woodland suitability) symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for important trees. The number 1 indicates very high productivity; 2, high; 3, moderately high; 4, moderate; and 5, low.

The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *x* indicates stoniness or rockiness; *w*, excessive water in or on the soil; *d*, restricted root depth; *c*, clay in the upper part of the soil; *f*, high content of coarse fragments in the soil profile; and *r*, steep slopes. The letter *o* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: x, w, d, c, f, and r.

In table 6, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Ratings of the *erosion hazard* indicate the risk of loss of soil in well managed woodland. The risk is *slight* if the expected soil loss is small, *moderate* if measures are needed to control erosion during logging and road construction, and *severe* if intensive management or special equipment and methods are needed to prevent excessive loss of soil.

Ratings of *equipment limitation* reflect the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. A rating of *slight* indicates that use of equipment is not limited to a particular kind of equipment or time of year; *moderate* indicates a short seasonal limitation or a need for some modification in management or in equipment; and *severe* indicates a seasonal limitation, a need for special equipment or management, or a hazard in the use of equipment.

Seedling mortality ratings indicate the degree to which the soil affects the mortality of tree seedlings. Plant competition is not considered in the ratings. The ratings apply to seedlings from good stock that are properly planted during a period of sufficient rainfall. A rating of *slight* indicates that the expected mortality is less than 25 percent; *moderate*, 25 to 50 percent; and *severe*, more than 50 percent.

Ratings of *windthrow hazard* are based on soil characteristics that affect the development of tree roots and the ability of the soil to hold trees firmly. A rating of *slight* indicates that a few trees may be blown down by normal winds; *moderate*, that some trees will be blown down during periods of excessive soil wetness and strong winds; and *severe*, that many trees are blown down during periods of excessive soil wetness and moderate or strong winds.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index*. This index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. Site index was determined at age 30 years for eastern cottonwood, 35 years for American sycamore, and 50 years for all other species. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Trees to plant are those that are suited to the soils and to commercial wood production.

recreation

Hamilton County has many recreation facilities, most of them privately owned. Recreation in the survey area is dominantly water based. Public picnic areas and boat launching ramps are provided on Chickamauga Lake by the Tennessee Valley Authority.

Two state parks, one federal park, and one county park are open to the public. The state and county parks have extensive recreation areas, including campgrounds.

The soils of the survey area are rated in table 7 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9.

Camp areas require site preparation such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking, horseback riding, and bicycling should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

wildlife habitat

Willis Gainer, biologist, Soil Conservation Service, helped prepare this section.

Although a large part of Hamilton County has been developed or is densely populated, the wildlife resources are still quite abundant. Good populations of dove and quail are found in the cropland and openland; squirrels are found where mast and den trees such as oaks and hickories have been retained; waterfowl are often abundant along the river and lakes; and deer occupy suitable wooded farmland. The abundance of trees and shrubs around homes and properties provides habitat for a great variety of non-game wildlife, such as songbirds.

About 71 percent, or 196,000 acres, of Hamilton County provides habitat for woodland wildlife, and about 15 percent, or 40,900 acres, of the county provides habitat for openland wildlife.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 8, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be

established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and soybeans.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, orchardgrass, ryegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, pokeberry, and crotons.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are bush honeysuckle, autumn-olive, and crabapple.

Coniferous plants furnish browse, seeds, and cones. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, hemlock, and cedar.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, spikebrush, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include ruffed grouse, woodcock, mourning dove, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, shore birds, muskrat, mink, and beaver.

engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology; (6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

building site development

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, or a very firm dense layer, stone content, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, high shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a restrictive layer, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

sanitary facilities

Table 10 shows the degree and the kind of soil limitations that affect septic tank absorption fields,

sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 10 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to effectively filter the effluent. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, and soil reaction affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

construction materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated

good, fair, or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, or have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

water management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or

site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or other restrictive layers. The performance of a system is affected by the depth of the root zone and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. Highly erodible soil, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

soil properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

engineering index properties

Table 13 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture (*4*). These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

physical and chemical properties

Table 14 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition.

In table 14, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

soil and water features

Table 15 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped

according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary inundation of an area, is caused by overflowing streams or by runoff from adjacent slopes. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 15 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs, on the average, no more than once in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. Only saturated zones within a depth of about 6 feet are indicated. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 15.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*5*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 16, the soils of the survey area are classified according to the system. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Typic Haplaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

soil series and their morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (*4*). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (*5*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

Allen series

The Allen series consists of deep, well drained, gently sloping to steep soils on foot slopes and hillsides. These soils formed in colluvium weathered from sandstone and shale. Slopes range from 3 to 40 percent.

Allen soils are on the same landscape as Holston and Waynesboro soils. Holston soils differ from the Allen soils mainly by having hue of 10YR and 7.5YR in the B horizon. Waynesboro soils have more than 35 percent clay in the particle-size control section.

Typical pedon of Allen loam, 3 to 12 percent slopes, in an old field, 0.5 mile from Mountain Creek Road on the W road, and 100 feet on left:

Ap—0 to 7 inches; brown (10YR 5/3) loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

B1—7 to 12 inches; yellowish brown (10YR 5/4) loam; weak fine subangular blocky structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

B21t—12 to 24 inches; yellowish red (5YR 4/6) clay loam; weak medium subangular blocky structure; friable; few fine and medium roots; thin discontinuous clay films; strongly acid; clear smooth boundary.

B22t—24 to 35 inches; yellowish red (5YR 5/6) clay loam; few medium distinct yellowish brown (10YR 5/4) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films; strongly acid; clear smooth boundary.

B23t—35 to 51 inches; yellowish red (5YR 5/6) clay loam; common medium distinct red (2.5YR 4/6) and yellowish brown (10YR 5/4) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films; 10 percent by volume pebbles 1/4 inch to 2 inches across; strongly acid; clear smooth boundary.

B24t—51 to 74 inches; red (2.5YR 4/6) clay loam; many faint dark red (2.5YR 3/6) and yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable; thin discontinuous clay films; strongly acid.

The thickness of the solum ranges from 60 to 80 inches. Reaction is strongly acid or very strongly acid except in areas where the surface layer has been limed. Sandstone pebbles and cobblestones make up 0 to 15 percent of the A horizon and 0 to 10 percent of the B horizon.

The Ap and A2 horizons have hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Some pedons have a thin A1 horizon that has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. The fine earth fraction is loam or fine sandy loam. In severely eroded areas, the A horizon has hue of 7.5YR or 5YR, value of 5, and chroma of 6 and is clay loam.

The B1 horizon has hue of 10YR to 5YR, value of 5, and chroma of 4 to 8. Texture is loam, fine sandy loam, clay loam, or sandy clay loam.

The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. Mottles in shades of red, brown, and yellow range from few to many in the lower part of the B2t horizon. Texture is clay loam or sandy clay loam.

Apison series

The Apison series consists of moderately deep, well drained, gently rolling and rolling soils on shale ridges. These soils formed in material weathered from shale. Slopes are smooth and convex and range from 5 to 15 percent.

Apison soils are on the same landscape as Enders and Nesbitt soils. Enders soils differ from the Apison soils mainly in having a clayey argillic horizon. Nesbitt soils have gray mottles within a depth of about 20 inches and are more than 40 inches to bedrock.

Typical pedon of Apison loam, 5 to 15 percent slopes, in a wooded area, 150 feet northwest on Tallant Road from intersection of McDonald and Tallant Roads, and 100 feet east of road:

Ap—0 to 7 inches; brown (10YR 5/3) loam; moderate medium granular structure; very friable; common fine roots; 3 percent by volume fragments of sandstone 1/4 inch to 1 inch in diameter; strongly acid; clear smooth boundary.

B21t—7 to 14 inches; yellowish brown (10YR 5/4) clay loam; moderate medium subangular blocky structure; friable; common fine roots; thin discontinuous clay films; 3 percent by volume fragments of sandstone 1/4 inch to 1 inch in diameter; very strongly acid; clear smooth boundary.

B22t—14 to 22 inches; yellowish brown (10YR 5/4) clay loam; few fine faint light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; friable; 5 percent by volume fragments of sandstone 1/4 inch to 1 inch across; thin discontinuous clay films; very strongly acid; clear smooth boundary.

B23t—22 to 28 inches; yellowish brown (10YR 5/6) clay loam; few medium faint pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; thin discontinuous clay films; 10 percent by volume fragments of sandstone 1/4 inch to 1 inch across; very strongly acid.

Cr—28 to 61 inches; soft interlayered shale, siltstone, and fine grained sandstone; thin seams and coating of brownish loam in upper 12 inches.

The thickness of the solum and the depth to soft shale bedrock range from 20 to 40 inches. The depth to hard shale is more than 60 inches. Small fragments of shale, siltstone, or sandstone make up 0 to 15 percent by volume of the solum. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. It is loam or silt loam.

The B2t horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. It is silt loam, clay loam, or silty clay loam.

Armuchee series

The Armuchee series consists of moderately deep, well drained, sloping to steep soils on shale ridges. These soils formed in material weathered from shale. Slopes range from 10 to 40 percent.

The Armuchee soils are on the same landscape as Montevallo and Enders soils. Montevallo soils do not have an argillic horizon, have more than 35 percent fragments of shale in the subsoil, and are shallow to rippable shale. Enders soils have a thicker argillic horizon and are deeper to bedrock than the Armuchee soils.

Typical pedon of Armuchee silt loam, 10 to 25 percent slopes, in a cleared area 1 mile east of Apison, 900 feet south of Apison Pike, underneath high voltage power line that crosses paved road:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; common fine roots; 10 percent by volume fragments of shale; strongly acid; clear smooth boundary.

B1—8 to 11 inches; strong brown (7.5YR 5/6) shaly silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; 20 percent by volume fragments of shale 1 inch to 3 inches long; thin discontinuous clay films on the faces of some peds; strongly acid; gradual wavy boundary.

B2t—11 to 17 inches; strong brown (7.5YR 5/6) shaly silty clay; moderate medium subangular blocky structure; firm, plastic; few fine roots; 25 percent by volume fragments of shale 1 inch to 3 inches long; thin discontinuous clay films; strongly acid; gradual wavy boundary.

C—17 to 24 inches; strong brown (7.5YR 5/6) very shaly silty clay; common medium and coarse distinct very pale brown (10YR 7/4), yellowish brown (10YR 5/4), and yellowish red (5YR 5/6) mottles; breaks to blocky and platy pieces along bedding planes of shale rocks; very firm, plastic; 60 percent by volume fragments of shale; some shale fragments can be crushed to fine earth; strongly acid.

Cr—24 to 60 inches; weakly consolidated noncalcareous shale that can be dug with a spade.

The thickness of the solum ranges from 10 to 20 inches, and the depth to soft shale bedrock ranges from 20 to 36 inches. The content of shale fragments ranges from 5 to 20 percent by volume in the A horizon, from 15 to 35 percent in the B horizon, and from 40 to 80 percent in the C horizon.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. In severely eroded areas, it also has hue of 7.5YR and 5YR, value of 4 or 5, and chroma of 6. The fine earth fraction is silt loam or silty clay loam.

The B horizon has hue of 10YR, 7.5YR, and 5YR, value of 4 or 5, and chroma of 6 or 8. Some pedons are mottled in shades of brown and red. The fine earth fraction is silty clay loam or silty clay.

The C horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 to 8. The fine earth fraction is silty clay loam or silty clay.

Barfield series

The Barfield series consists of shallow, well drained, moderately steep and steep soils on uplands. These soils formed in material weathered from limestone. Slopes range from 10 to 40 percent.

Barfield soils are on the same landscape as the Colbert and Talbott soils. Talbott and Colbert soils differ from the Barfield soils mainly by being more than 20 inches deep to bedrock.

Typical pedon of Barfield silty clay loam, 10 to 40 percent slopes, on U.S. Highway 41 West, 300 feet east of Lookout Tourist Lodge, 250 feet on right in woods:

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) silty clay loam; moderate medium granular structure; friable; many fine and medium roots; 5 percent by volume fragments of limestone; mildly alkaline; gradual smooth boundary.

B21—5 to 9 inches; very dark grayish brown (10YR 3/2) silty clay; moderate medium subangular blocky structure; firm; many fine and medium roots; 5 percent by volume fragments of limestone; mildly alkaline; clear wavy boundary.

B22—9 to 13 inches; very dark grayish brown (10YR 3/2) silty clay; common medium faint brown (10YR 5/3) mottles; moderate medium subangular blocky structure; firm; few fine roots; 5 percent by volume fragments of limestone; mildly alkaline; clear wavy boundary.

B3—13 to 16 inches; light olive brown (2.5Y 5/4) silty clay; few fine faint light yellowish brown (10YR 6/4) mottles; moderate medium subangular blocky structure; 5 percent by volume fragments of limestone; firm; few fine roots; mildly alkaline.

R—16 inches; limestone bedrock.

The thickness of the solum and the depth to bedrock range from 8 to 20 inches. The content of limestone fragments ranges from 2 to 15 percent by volume in each horizon. Reaction is neutral or mildly alkaline throughout.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 2 to 3.

The B2 horizon has hue of 10YR, value of 2 or 3, and chroma of 2 or 3. Texture is silty clay or clay.

The B3 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 to 6. The horizon is mottled in shades of brown. It is a silty clay or clay.

Bodine series

The Bodine series consists of deep, somewhat excessively drained, sloping to steep cherty soils on ridges of the limestone valleys. Slopes range from 5 to 45 percent.

The Bodine soils are on the same landscape as Fullerton, Minvale, and Shack soils. The Fullerton soils are redder, contain less chert than the Bodine soils, and have a clayey subsoil. The Minvale soils are on foot slopes and contain less chert. Shack soils have gray mottles within 30 inches of the surface and a layer in the subsoil that slows water movement.

Typical pedon of Bodine cherty silt loam, 5 to 12 percent slopes, on Mission Fork Road, 0.7 mile from the intersection of Osage Road and Union Fork Road:

Ap—0 to 6 inches; pale brown (10YR 6/3) cherty silt loam; moderate medium granular structure; friable; common fine roots; 35 percent by volume fragments of chert; strongly acid; abrupt smooth boundary.

B1—6 to 10 inches; light yellowish brown (10YR 6/4) cherty silt loam; moderate medium subangular blocky structure; friable; few fine roots; 35 percent by volume fragments of chert 1/2 inch to 2 inches across; very strongly acid; clear wavy boundary.

B21t—10 to 25 inches; brownish yellow (10YR 6/6) cherty silty clay loam; moderate medium subangular blocky structure; friable; 35 percent by volume fragments of chert 1 inch to 3 inches across; very strongly acid; clear wavy boundary.

B22t—25 to 50 inches; yellowish brown (10YR 5/6) very cherty silty clay loam; moderate medium subangular blocky structure; friable; 60 percent by volume fragments of chert 1 inch to 3 inches across; very strongly acid; gradual wavy boundary.

B23t—50 to 65 inches; strong brown (7.5YR 5/6) very cherty silty clay loam; moderate medium subangular blocky structure; friable; 60 percent by volume chert fragments 1 to 3 inches across; very strongly acid.

The thickness of the solum and the depth to bedrock are greater than 60 inches. The content of chert fragments ranges from 30 to 60 percent by volume in the A horizon and from 35 to 70 percent by volume in the B horizon. Most of the fragments are less than 3 inches in diameter. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. Some pedons have a thin A1 horizon that has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. The fine earth fraction is silt loam or loam.

The B1 horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 or 6.

The B2t and B3 horizons have hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. The fine earth fraction is silt loam or silty clay loam.

Bouldin series

The Bouldin series consists of deep, well drained, steep, stony soils on mountainsides. These soils formed in colluvium from sandstone and shale. Slopes range from 20 to 60 percent.

Bouldin soils are on the same landscape as the Allen and Gilpin soils. The Allen soils are on a lower part of the slopes than the Bouldin soils and contain less than 15 percent by volume sandstone fragments. Gilpin soils are on convex slopes, contain less than 35 percent shale fragments, and are less than 40 inches to bedrock.

Typical pedon of Bouldin stony loam, 20 to 60 percent slopes, in wooded area on Montlake Road, 1 1/2 miles from intersection of U.S. Highway 27, 200 feet northeast of road:

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) stony loam; weak fine granular structure; very friable; common fine and medium roots; 20 percent of the surface is covered by fragments of sandstone 1 inch to about 18 inches across; very strongly acid; abrupt smooth boundary.

A2—2 to 7 inches; brown (10YR 4/3) stony loam; weak medium granular structure; very friable; common fine and medium roots; 25 percent by volume fragments of sandstone 1 inch to about 18 inches across; very strongly acid; clear smooth boundary.

B1—7 to 18 inches; strong brown (7.5YR 5/6) stony loam; weak fine and medium subangular blocky structure; friable; many fine and medium roots; 30 percent by volume fragments of sandstone 1 inch to about 18 inches across; very strongly acid; clear smooth boundary.

B21t—18 to 30 inches; yellowish red (5YR 4/6) stony clay loam; moderate medium subangular blocky structure; friable; many fine roots; thin discontinuous clay films; 50 percent by volume fragments of sandstone 1 inch to about 20 inches across; strongly acid; 50 percent by volume sandstone rocks; gradual wavy boundary.

B22t—30 to 40 inches; yellowish red (5YR 4/6) stony clay loam; moderate medium subangular blocky structure; friable; 60 percent by volume fragments of sandstone, 1 inch to about 20 inches across; strongly acid; gradual wavy boundary.

B23t—40 to 80 inches; yellowish red (5YR 4/6) stony clay loam; weak fine and medium subangular blocky structure; friable; thin discontinuous clay films; 65 percent by volume fragments of sandstone 1 inch to about 36 inches across; strongly acid; gradual wavy boundary.

The thickness of the solum is more than 60 inches and the depth to bedrock ranges from 6 to 20 feet. Reaction is strongly acid or very strongly acid. Fragments of sandstone 1 inch to about 36 inches across make up 15 to 40 percent of the A horizon and

35 to 65 percent of the B horizon. In a few places, boulders as large as 10 feet across are on the surface.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 4. The fine earth fraction is loam or sandy loam.

The B1 horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 or 8. The fine earth fraction is loam or sandy loam.

The B2t horizon has hue of 5YR, 7.5YR, or 2.5YR, value of 4 or 5, and chroma of 6 or 8. The fine earth fraction is clay loam or sandy clay loam.

Capshaw series

The Capshaw series consists of deep, moderately well drained, gently sloping soils. These soils formed in old alluvium or in a layer of alluvium and the underlying clayey residuum on stream terraces and uplands. Slopes range from 2 to 6 percent.

Capshaw soils are on the same landscape as Colbert, Talbott, and Tupelo soils. Colbert soils have more than 60 percent clay in the upper 20 inches of the argillic horizon. Talbott soils are well drained and have a reddish subsoil. Tupelo soils are on lower positions than the Capshaw soils and are somewhat poorly drained. They have mottles of chroma of 2 or less in the upper 10 inches of the argillic horizon.

Typical pedon of Capshaw silt loam, 2 to 6 percent slopes, 1/8 mile north of Ooltewah on Georgetown Road, 100 feet on right:

Ap—0 to 4 inches; yellowish brown (10YR 5/4) silt loam; moderate medium granular structure; very friable; many fine roots; medium acid; clear smooth boundary.

B21t—4 to 15 inches; yellowish brown (10YR 5/6) silty clay loam; weak medium subangular blocky structure; friable; common fine roots; thin discontinuous clay films; strongly acid; gradual smooth boundary.

B22t—15 to 24 inches; yellowish brown (10YR 5/6) silty clay; few fine distinct light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; friable; few fine roots; thin continuous clay films; strongly acid; gradual smooth boundary.

B23t—24 to 30 inches; yellowish brown (10YR 5/6) clay; common fine and medium distinct light gray (10YR 7/2) mottles; moderate medium subangular and angular blocky structure; firm; thin continuous clay films; strongly acid; gradual wavy boundary.

B24t—30 to 45 inches; yellowish brown (10YR 5/6) clay; many fine and medium distinct yellowish brown (10YR 5/8) and light gray (10YR 7/2) mottles; moderate medium angular blocky structure; firm; thin discontinuous clay films; common fine and medium black and brown concretions; strongly acid; gradual wavy boundary.

C—45 to 60 inches; mottled grayish brown (2.5Y 5/2), yellowish brown (10YR 5/6), and light olive brown (2.5Y 5/4) clay; massive; very firm; many fine and medium black and brown concretions; medium acid.

The depth to limestone bedrock ranges from about 48 to 84 inches. The thickness of the solum ranges from 40 to 60 inches. Reaction is medium acid or strongly acid, except in areas where the surface layer has been limed and in the horizons just above bedrock, which are less acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

The B2t horizon has hue of 7.5YR, 10YR, and 2.5Y, value of 4 or 5, and chroma of 4 to 8. The B22t, B23t, and B24t subhorizons have few to many mottles in shades of gray, brown, and red. Texture is silty clay loam, silty clay, or clay in the upper 2 feet and silty clay or clay below.

The C horizon has hue of 2.5Y, value of 5 or 6, and chroma of 0 to 4. In some pedons, it is mottled and has no dominant color. Texture is silty clay or clay.

Colbert series

The Colbert series consists of deep, moderately well drained, gently sloping to moderately steep soils on uplands. These soils formed in residuum of argillaceous limestone. Slopes range from 2 to 20 percent.

Colbert soils are on the same landscape as Talbott, Capshaw, Collegedale, and Tupelo soils. Capshaw and Collegedale soils differ from Colbert soils mainly by having less than 60 percent clay in the upper 20 inches of the argillic horizon. Collegedale soils are more than 60 inches deep to bedrock. Talbott soils have redder hues in the subsoil. Tupelo soils have gray mottles in the upper part of the subsoil.

Typical pedon of Colbert silt loam, 2 to 12 percent slopes; Morris Hill Road 1 mile past intersection with East Brainerd Road; 50 feet on left, in filed:

Ap—0 to 4 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many fine roots; medium acid; clear smooth boundary.

B21t—4 to 14 inches; yellowish brown (10YR 5/6) clay; moderate medium subangular blocky structure; firm; few fine roots; thin discontinuous clay films; strongly acid; clear smooth boundary.

B22t—14 to 22 inches; yellowish brown (10YR 5/8) clay; common fine and medium distinct mottles of light gray (10YR 7/2) and light brownish gray (10YR 6/2); moderate medium subangular blocky structure; firm; few fine roots; thick discontinuous clay films; strongly acid; clear smooth boundary.

B23t—22 to 45 inches; yellowish brown (10YR 5/6) clay; common fine and medium distinct strong brown (7.5YR 5/8), light gray (10YR 7/2), and light brownish gray (10YR 6/2) mottles; moderate

medium subangular blocky structure; firm; thin discontinuous clay films; few slickensides; few fine dark concretions; medium acid; clear smooth boundary.

C—45 to 55 inches; olive (5Y 5/4) clay; common medium distinct light gray (10YR 7/2), yellowish brown (10YR 5/8), and light brownish gray (10YR 6/2) mottles; massive; very firm; few slickensides; many pressure faces; slightly acid.

R—55 inches; limestone bedrock.

The thickness of the solum and the depth to bedrock range from 40 to 60 inches. Reaction ranges from slightly acid to strongly acid, except in the layers just above limestone bedrock, which range from slightly acid to mildly alkaline.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam or silty clay loam. In eroded areas, the Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. Texture is silty clay loam, silty clay, or clay.

The B2t horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 to 8. The upper 10 inches of this horizon is free of mottles, but below this it is mottled in shades of gray and brown.

The C horizon has hue of 7.5YR to 5Y, value of 5 or 6, and chroma of 3 to 8. Mottles in shades of brown and gray are present. Some pedons have a B3 horizon which has the same colors and textures as the C horizon.

Collegedale series

The Collegedale series consists of deep, well drained, gently sloping to moderately steep soils that formed in material weathered from limestone. Slopes range from 2 to 25 percent.

Collegedale soils are on the same landscape as the Talbott, Colbert, and Enders soils. The Talbott and Colbert soils differ from the Collegedale soils mainly by being less than 60 inches deep to limestone bedrock, and the Enders soils differ mainly in being less than 60 inches deep to shale bedrock.

Typical pedon of Collegedale silt loam, 2 to 12 percent slopes, 1 1/2 miles east of Collegedale on Tallant Road, 500 feet on left, and 50 feet east of barn:

Ap—0 to 6 inches; brown (7.5YR 4/4) silt loam; moderate medium granular structure; friable; many fine roots; few fine fragments of chert less than 1 inch in diameter; strongly acid; abrupt smooth boundary.

B21t—6 to 16 inches; yellowish red (5YR 5/6) clay; moderate medium subangular blocky structure; very firm; common fine roots; thin continuous clay films on faces of peds; strongly acid; clear smooth boundary.

B22t—16 to 22 inches; yellowish red (5YR 5/6) clay; few fine and medium distinct yellowish brown (10YR 5/6) and olive yellow (2.5Y 6/6) mottles; moderate medium subangular blocky structure; very firm; few fine roots; thin continuous clay skins on faces of peds; strongly acid; clear smooth boundary.

B23t—22 to 32 inches; yellowish red (5YR 5/8) clay; common medium and coarse distinct brownish yellow (10YR 6/6), olive yellow (2.5Y 6/6), and red (2.5YR 5/6) mottles; moderate medium angular blocky structure parting to moderate fine angular blocky; thin discontinuous clay films on faces of peds; strongly acid; gradual smooth boundary.

B24t—32 to 53 inches; yellowish red (5YR 5/8) clay; many medium and coarse faint and distinct red (2.5YR 5/6), light yellowish brown (10YR 6/4), and olive yellow (2.5Y 6/6) mottles; moderate medium angular blocky structure parting to moderate fine angular blocky; very firm; thin discontinuous clay skins on faces of peds; strongly acid; gradual smooth boundary.

B25t—53 to 80 inches; mottled yellowish red (5YR 5/6), light yellowish brown (10YR 6/4), red (2.5YR 5/6), light gray (10YR 7/2), and olive yellow (2.5Y 6/6) clay; weak medium subangular blocky structure; very firm; thin discontinuous clay films on faces of peds; strongly acid.

The thickness of the solum and the depth to bedrock are greater than 60 inches. The content of chert fragments ranges from 0 to 10 percent by volume in each horizon. Most of the fragments are less than 2 inches in diameter. Reaction is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4, except in severely eroded areas, where the hue is 7.5YR, 2.5YR, and 5YR, the value is 4 or 5, and the chroma is 6. Texture is silt loam, but in severely eroded areas it ranges to silty clay loam or silty clay.

The B2t horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 to 8. Some pedons also have hue of 7.5YR in the B21t horizon. Mottles in shades of brown, yellow, and olive are present. Some gray mottles are in the lower part. Texture is silty clay or clay.

Crossville series

The Crossville series consists of moderately deep, well drained, gently sloping soils on broad plateaus of the Cumberland Mountains. These soils formed in material weathered from acid sandstone. Slopes range from 2 to 5 percent.

Crossville soils are on the same landscape as Lily and Ramsey soils. The Ramsey soils differ from the Crossville soils mainly by having bedrock within 20 inches of the surface. The Lily soils have a lighter colored A horizon and have an argillic horizon.

Typical pedon of Crossville loam, 2 to 5 percent slopes, on Signal Mountain at the intersection of Sawyer Road and Radio Tower Road, 100 feet on Radio Tower Road and 100 feet on right in woods:

A1—0 to 10 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.
B1—10 to 15 inches; brown (10YR 4/3) loam; weak medium subangular blocky structure; friable; few fine roots; strongly acid; gradual smooth boundary.
B2—15 to 28 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; friable; few fine roots; strongly acid; gradual smooth boundary.
C—28 to 32 inches; yellowish brown (10YR 5/6) loamy sand; single grain; very friable; very strongly acid.
R—32 inches; sandstone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. The content of sandstone fragments ranges from 0 to 5 percent in the solum and from 0 to 15 percent in the C horizon.

The A horizon has hue of 10YR or 7.5R, value of 3, and chroma of 2 or 3. It is loam or sandy loam.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. It is loam, sandy clay loam, or clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 to 6. It is loamy sand or sandy loam.

Dewey series

The Dewey series consists of deep, well drained, gently sloping to moderately steep soils that formed in material weathered from limestone. Slopes range from 2 to 25 percent.

The Dewey soils are on the same landscape as Fullerton and Etowah soils. The Fullerton soils differ from the Dewey soils mainly in having more than 15 percent chert in each horizon and an A horizon that has hue of 10YR or 7.5YR. The Etowah soils have a fine-loamy particle-size control section.

Typical pedon of Dewey silt loam, 2 to 12 percent slopes, 800 feet south on Highway 58 from the intersection of Highway 58 and Grasshopper Road, 50 feet to left of Highway 58:

Ap—0 to 4 inches; dark reddish brown (5YR 3/4) silt loam; moderate medium granular structure; friable; common fine roots; strongly acid; clear smooth boundary.
B21t—4 to 12 inches; red (2.5YR 4/6) clay; weak fine subangular blocky structure; firm; common fine roots; thin discontinuous clay films; strongly acid; clear smooth boundary.
B22t—12 to 20 inches; dark red (2.5YR 3/6) clay; moderate medium subangular blocky structure; firm; few fine roots; thin continuous clay films; few fragments of chert 1 inch in diameter; strongly acid; clear smooth boundary.
B23t—20 to 34 inches; dark red (2.5YR 3/6) clay; few fine faint red (2.5YR 4/8) mottles; moderate medium subangular blocky structure; firm; thin continuous clay films; few fragments of chert 1/2 inch to 1 inch in diameter; strongly acid; gradual smooth boundary.
B24t—34 to 60 inches; red (2.5YR 4/6) clay; common medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; few black stains and concretions; thin discontinuous clay films; strongly acid.

The thickness of the solum and the depth to bedrock are greater than 60 inches. Fragments of chert are throughout the solum and range from 0 to 15 percent of its volume. The fragments are mostly less than 2 inches in diameter. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed.

The Ap horizon has hue of 7.5YR or 5YR, value of 3 to 5, and chroma of 3 to 6. Texture is silt loam or silty clay loam, except in severely eroded areas, where texture ranges to clay.

The B2t horizon has hue of 5YR or 2.5YR, value of 3 to 5, and chroma of 6 to 8 in the upper part and hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8 in the lower part. The lower part of the B2t horizon has few to many mottles in shades of brown and red. Texture is silty clay or clay.

Some pedons have a B3 horizon that has weak subangular blocky structure. Colors and textures are the same as in the lower part of the B2t horizon.

Dunning series

The Dunning series consists of deep, poorly drained, nearly level, slowly permeable soils that formed in thick deposits of alluvium along drainageways. Slopes range from 0 to 2 percent.

Dunning soils are on the same landscape as the Tupelo and Newark soils. Unlike the Dunning soils, Tupelo soils are on low terraces, have an argillic horizon, and are somewhat poorly drained. Newark soils are on flood plains, are loamy, and are somewhat poorly drained.

Typical pedon of Dunning silty clay loam in an area 1 mile south of Tyner; take road to right and go 1/4 mile; 500 feet east of Friar Branch, in field:

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silty clay loam; strong fine granular structure; firm; many fine roots; neutral; clear smooth boundary.
Alg—7 to 19 inches; very dark gray (10YR 3/1) silty clay loam; common fine distinct dark yellowish brown

(10YR 4/4) mottles; strong fine angular blocky structure; firm; few fine roots; neutral; gradual smooth boundary.
Bg—19 to 46 inches; dark gray (N 4/) clay; many medium distinct yellowish brown (10YR 5/6) mottles; moderate fine angular blocky structure; firm; neutral; gradual wavy boundary.
Cg—46 to 60 inches; dark gray (N 4/) clay; many coarse distinct yellowish brown (10YR 5/6) mottles; massive; firm; neutral.

The depth to bedrock is more than 60 inches. The thickness of the solum ranges from 30 to 50 inches. Reaction is mildly alkaline or neutral throughout.

The A horizon has hue of 10YR or 2.5Y, value of 3, and chroma of 0 to 2.

The Bg and Cg horizons have hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 1 or 0. Texture is silty clay or clay.

The Dunning soils in this county are taxadjuncts to the Dunning series. They have a soil temperature that is slightly warmer than the range defined for the series, but this difference does not affect the use and management of these soils.

Emory series

The Emory series consists of deep, well drained, nearly level and gently sloping soils that formed in deposits of alluvium along drainageways, on foot slopes, and in concave areas. Slopes range from 0 to 4 percent.

Emory soils are on the same landscape as the Dewey and Etowah soils. Dewey soils are on uplands, and Etowah soils are on foot slopes and terraces. Unlike the Emory soils, the Dewey and Etowah soils have a thick argillic horizon.

Typical pedon of Emory silt loam in a field off Interstate 75, Summit exit, 300 feet to right of Summit Road:

Ap—0 to 7 inches; dark reddish brown (5YR 3/4) silt loam; weak fine granular structure; friable; many fine and medium roots; medium acid; clear smooth boundary.
B2—7 to 24 inches; dark reddish brown (5YR 3/4) silt loam; weak fine subangular blocky structure; friable; few fine roots; medium acid; clear smooth boundary.
A1b—24 to 36 inches; dark reddish brown (5YR 3/3) silt loam; weak medium granular structure; friable; few fine roots; medium acid; clear wavy boundary.
B2tb—36 to 60 inches; strong brown (7.5YR 5/6) silty clay loam; weak fine granular and weak medium subangular blocky structure; friable; thin discontinuous clay films; strongly acid.

The depth to rock is greater than 60 inches. Reaction is medium acid or strongly acid, except in areas where the surface layer has been limed. Chert fragments and pebbles make up 0 to 5 percent by volume of the Ap and B2 horizons and 0 to 15 percent of the buried horizons.

The Ap horizon has hue of 5YR or 7.5YR, value of 3, and chroma of 2 to 4.

The B2 horizon has hue of 5YR or 2.5YR, value of 3 to 5, and chroma of 2 to 4.

The A1b horizon has hue of 7.5YR or 5YR, value of 3 or 4, and chroma of 2 to 4.

The B2t horizon has hue of 7.5YR or 5YR, value of 3 to 5, and chroma of 3 to 8. It is silty clay loam or silty clay.

Enders series

The Enders series consists of deep, well drained, gently sloping to moderately steep soils that formed in residuum of acid shale. These soils are on slopes of shale ridges. Slopes range from 2 to 25 percent.

Enders soils are on the same landscape as Armuchee and Montevallo soils. Armuchee soils differ from the Enders soils mainly in having an argillic horizon that is less than 10 inches thick and in being less than 40 inches deep to shale bedrock. Montevallo soils are less than 20 inches deep to weathered shale and have a loamy-skeletal particle-size control section.

Typical pedon of Enders silt loam, 2 to 12 percent slopes, 1 mile south of Apison; take road to left 3/4 mile; 150 feet on right of road:

Ap—0 to 6 inches; brown (10YR 5/3) silt loam; moderate medium granular structure; friable; common fine roots; medium acid; clear smooth boundary.
B1—6 to 10 inches; brown (7.5YR 5/4) silt loam; weak fine subangular blocky structure; friable; common fine roots; strongly acid; clear wavy boundary.
B21t—10 to 21 inches; yellowish red (5YR 5/8) silty clay; moderate medium subangular blocky structure; firm; few fine roots; thin discontinuous clay films; very strongly acid; gradual wavy boundary.
B22t—21 to 29 inches; yellowish red (5YR 5/8) clay; common medium distinct reddish yellow (7.5YR 6/6) mottles; strong fine and medium angular blocky structure; firm; thick continuous clay films; very strongly acid; gradual wavy boundary.
B23t—29 to 38 inches; yellowish red (5YR 5/6) clay; common medium distinct light grayish brown (10YR 6/2) and red (2.5YR 4/8) mottles; moderate fine and medium angular blocky structure; very firm; thick continuous clay films; 10 percent by volume fragments of shale; very strongly acid; gradual wavy boundary.
C—38 to 47 inches; mottled red (2.5YR 4/8), light gray (5Y 6/1), and light olive brown (2.5Y 5/4) very shaly clay; weak medium platy structure; very firm; 50 percent by volume weathered shale fragments; very strongly acid.

Cr—47 to 60 inches; weathered thinly layered shale; most fragments of shale can be crushed in hands.

The thickness of the solum ranges from 32 to 50 inches. The depth to soft shale bedrock is commonly 40 to 50 inches, but ranges to 60 inches. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed. The A and B1 horizons contain 0 to 25 percent by volume pebbles and cobblestones 1 inch to 5 inches in diameter. The content of shale fragments ranges from 0 to 15 percent in the B2t horizon and from 25 to 50 percent in the B3 and C horizons.

Some pedons have a thin A1 horizon which has hue of 10YR, value of 3 or 4, chroma of 2 or 3. The Ap or A2 horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The fine earth fraction is silt loam or loam. The Ap horizon in eroded areas has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. Texture is silty clay loam.

The B1 horizon has hue of 7.5YR, value of 5, and chroma of 4 to 8. The B2t horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 to 8. The lower part of the B2t commonly has mottles in shades of gray, red, or brown. Texture is silty clay or clay.

The B3 and C horizons are mottled in shades of red, gray, and brown. The fine earth fraction is silty clay or clay. The Cr horizon is thinly layered, weathered shale that is easily crushed. The shale gradually becomes harder as depth increases.

Ennis series

The Ennis series consists of deep, well drained, nearly level cherty soils that formed in alluvium derived from soils underlain by limestone and shale. These soils are on bottom lands, along drainageways, and in depressions. Slopes range from 0 to 2 percent.

Ennis soils are on the same landscape as Humphreys, Lobelville, and Roane soils. The Humphreys soils differ from the Ennis soils mainly by having an argillic horizon. The Lobelville soils have gray mottles within 20 inches of the surface. The Roane soils have a fragipan.

Typical pedon of Ennis cherty silt loam 0.8 mile north of the intersection of Tennessee Highway 58 and Mahan Gap Road; take road to left 0.6 mile; 200 feet on right:

Ap—0 to 6 inches; dark yellowish brown (10YR 4/4) cherty silt loam; weak fine granular structure; very friable; many fine roots; 20 percent by volume fragments of chert 1/2 inch across; strongly acid; clear smooth boundary.

B1—6 to 24 inches; yellowish brown (10YR 5/4) cherty silt loam; weak fine granular structure; friable; common fine roots; 20 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; clear smooth boundary.

B21—24 to 38 inches; yellowish brown (10YR 5/4) cherty silt loam; weak fine subangular blocky structure; friable; few fine roots; 20 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; clear smooth boundary.

B22—38 to 45 inches; yellowish brown (10YR 5/6) cherty silty clay loam; moderate medium subangular blocky structure; friable; 20 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; clear smooth boundary.

C—45 to 60 inches; yellowish brown (10YR 5/6) cherty silty clay loam; few thin strata that are more sandy; few fine faint very pale brown (10YR 7/3) mottles; massive; friable; 20 percent by volume fragments of chert 1/4 inch to 1 inch across; strongly acid.

The thickness of the solum ranges from 38 inches to more than 60 inches. The depth to bedrock is greater than 60 inches. Reaction is strongly acid, except in areas where the surface layer has been limed. The content of coarse fragments ranges from 15 to 35 percent by volume in each horizon, except in the C horizon, where it ranges from 15 to 50 percent.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 6. It is cherty loam or cherty silt loam.

The B horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. It is cherty silt loam or cherty silty clay loam.

Some pedons have an A1b horizon that is brown cherty silt loam or cherty loam.

The C horizon has the same colors as the B horizon except that it is mottled in shades of brown. The texture is cherty silty clay loam or cherty silt loam. Thin strata of more sandy material are in some pedons.

Etowah series

The Etowah series consists of deep, well drained, gently sloping to moderately steep soils that formed in thick deposits of alluvium. These soils are on stream terraces, alluvial fans, and foot slopes below steep ridges. Slopes range from 2 to 20 percent.

Etowah soils are on the same landscape as Emory, Sequatchie, and Waynesboro soils. Emory soils do not have an argillic horizon. The Sequatchie soils have a thinner solum than the Etowah soils and typically are yellower in hue. The Waynesboro soils have more than 35 percent clay in the particle-size control section.

Typical pedon of Etowah silt loam, 2 to 12 percent slopes, 1/2 mile south of Tyner on Hickory Valley Road, 500 feet on road to left, 50 feet on right of road, in field:

Ap—0 to 6 inches; dark brown (6.5YR 3/2) silt loam; moderate medium granular structure; friable; common fine roots; strongly acid; abrupt smooth boundary.

B1—6 to 13 inches; reddish brown (5YR 4/4) silt loam; moderate medium granular and weak fine

subangular blocky structure; friable; common fine roots; strongly acid; clear smooth boundary.

B21—13 to 25 inches; red (2.5YR 4/8) silty clay loam; weak fine subangular blocky structure; friable; common fine roots; thin discontinuous clay films; strongly acid; gradual smooth boundary.

B22t—25 to 40 inches; red (2.5YR 4/6) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films; strongly acid; clear smooth boundary.

B23t—40 to 62 inches; red (2.5YR 4/6) silty clay loam; common fine distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable; thin discontinuous clay films; strongly acid.

The depth to rock and the thickness of the solum are greater than 60 inches. Reaction is strongly acid or very strongly acid throughout, except in areas where the surface layer has been limed. The content of pebbles or rock fragments ranges from 0 to 15 percent in each horizon.

The Ap horizon has hue of 10YR, 7.5YR, or 5YR, value of 3, and chroma of 2 to 4. It is silt loam or loam.

The B1 horizon has hue of 5YR or 2.5YR, value of 4, and chroma of 4. It is silt loam or silty clay loam.

The B2t horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 4 to 8. It is silty clay loam or clay loam.

Fullerton series

The Fullerton series consists of deep, gently sloping to steep, cherty, well drained soils that formed in residuum of limestone. These soils are on limestone ridges and valleys. Slopes are normally smooth and convex. Slopes range from 3 to 40 percent.

Fullerton soils are on the same landscape as Bodine, Dewey, and Minvale soils. Bodine soils have more than 35 percent fragments of chert in the B horizon. Dewey soils have less than 15 percent fragments of chert in each horizon and have a darker surface layer than Fullerton soils. Minvale soils are on foot slopes and alluvial fans and have a fine-loamy particle-size control section.

Typical pedon of Fullerton cherty silt loam, 3 to 7 percent slopes, 200 feet east of the intersection of Hunter Road and Harmon Farm Road:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) cherty silt loam; moderate medium granular structure; very friable; many fine and medium roots; 15 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; abrupt smooth boundary.

A2—3 to 10 inches; brown (10YR 5/3) cherty silt loam; moderate medium granular structure; very friable; many fine roots; 15 percent by volume fragments of chert 1/2 inch to 1 inch across; very strongly acid; clear smooth boundary.

B1—10 to 14 inches; yellowish red (5YR 4/6) cherty silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; 20 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; clear smooth boundary.

B21t—14 to 20 inches; red (2.5YR 5/8) cherty clay; moderate medium subangular blocky structure; firm; thin discontinuous clay films; common fine roots; 20 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; clear smooth boundary.

B22t—20 to 38 inches; red (2.5YR 5/6) cherty clay; moderate medium subangular blocky structure; firm; few fine roots; thin discontinuous clay films; 15 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; gradual smooth boundary.

B23t—38 to 47 inches; red (2.5YR 4/6) cherty clay; strong medium subangular blocky structure; firm; few fine roots; thick continuous clay films; 15 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; gradual smooth boundary.

B24t—47 to 65 inches; red (2.5YR 4/6) cherty clay; common medium distinct light yellowish brown (10YR 6/4) and strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; firm; thick continuous clay films; 15 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid.

The thickness of the solum and the depth to bedrock are greater than 60 inches. These soils are strongly acid or very strongly acid, except in areas where the surface layer has been limed. The content of chert fragments ranges from 15 to 35 percent by volume in each horizon.

The A horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 2 to 4. Pedons in severely eroded areas have an Ap horizon that also has hue of 5YR and chroma of 6. Texture of the fine earth fraction is silt loam or loam, except in small, severely eroded areas which have texture of silty clay loam or clay.

The B1 horizon has hue of 5YR or 7.5YR, value of 4 or 5, and chroma of 6 or 8. The fine earth fraction is silt loam or silty clay loam. The B2t horizon has hue of 2.5YR or 5YR, value of 4 or 5, and chroma of 6 or 8. In most pedons the lower part of the B2t horizon is mottled in shades of brown and red. The fine earth fraction is silty clay or clay.

Gilpin series

The Gilpin series consists of moderately deep, well drained, moderately permeable soils on moderately steep and steep shale ridges of the Cumberland Mountains. These soils formed in material that weathered from shale. Slopes are dominantly 12 to 40 percent but range to 60 percent in a few areas.

The Gilpin soils are on the same landscape as Sequoia, Bouldin, and Lily soils. The Lily soils have a higher sand content and fewer rock fragments in the subsoil than the Gilpin soils. The Sequoia soils have a clayey argillic horizon. Bouldin soils are loamy-skeletal and are deeper than 60 inches to bedrock.

Typical pedon of Gilpin silt loam, 12 to 25 percent slopes, on Signal Mountain, 300 feet NW from the end of Murrell Road:

A2—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; friable; many fine roots; 5 percent by volume shale fragments 1/8 inch to 1/4 inch across; strongly acid; abrupt smooth boundary.

B1—3 to 8 inches; yellowish brown (10YR 5/4) silt loam; moderate medium granular structure; friable; common fine and medium roots; 10 percent by volume fragments of shale 1/8 inch to 1/4 inch across; strongly acid; clear smooth boundary.

B21t—8 to 16 inches; strong brown (7.5YR 5/8) shaly silt loam; moderate medium subangular blocky structure; friable; common fine and medium roots and few coarse roots; thin discontinuous clay films; 20 percent by volume fragments of shale 1/8 inch to 1 inch across; strongly acid; gradual smooth boundary.

B22t—16 to 24 inches; strong brown (7.5YR 5.8) shaly silt loam; moderate medium subangular blocky structure; friable; few fine, medium, and coarse roots; thin discontinuous clay films; 25 percent by volume fragments of shale 1/16 inch to 3 inches across; strongly acid; gradual smooth boundary.

B3—24 to 30 inches; yellowish brown (10YR 5/8) shaly silt loam; few fine faint brown (10YR 5/3) mottles; weak fine subangular blocky structure; friable; few fine roots; 40 percent by volume fragments of shale 1/16 inch to 3 inches across; strongly acid.

Cr—30 to 40 inches; fractured shale with silt coating in cracks and on fragments. The shale can be dug with a spade.

The thickness of the solum ranges from 18 to 36 inches and the depth to bedrock ranges from 20 to 40 inches. The content of shale fragments ranges from 5 to 20 percent by volume in the A horizon, from 5 to 35 percent in the B2t horizon, and from 30 to 75 in the B3 and C horizons.

The A horizon has hue of 10YR, value of 3 through 5, and chroma of 2 through 4. It is strongly acid or very strongly acid, except in areas where the surface layer has been limed. The fine earth fraction is silt loam or loam.

The B horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 6 to 8. The fine earth fraction is silt loam and silty clay loam. Some pedons have a C horizon which has colors and textures similar to those of the B horizon.

Guthrie series

The Guthrie series consists of nearly level, poorly drained soils that have a compact, slowly permeable fragipan in the subsoil. These soils formed in a loamy mantle on upland flats and in depressions. Slopes range from 0 to 2 percent.

Guthrie soils are on the same landscape as Woodmont and Tupelo soils, which differ from Guthrie soils mainly by being somewhat poorly drained. Woodmont soils are not dominantly gray in the upper part of the B horizon, and Tupelo soils have a clayey argillic horizon.

Typical pedon of Guthrie silt loam in an area 10.5 miles north of Highway 153 on Hixon Pike; take road to the right 0.3 mile; 250 feet on left of road:

Ap—0 to 6 inches; grayish brown (2.5Y 5/2) silt loam; moderate medium granular structure; very friable; many fine and medium roots; strongly acid; abrupt smooth boundary.

B2g—6 to 30 inches; light gray (2.5Y 7/2) silt loam; common fine distinct light yellowish brown (2.5Y 6/4) and brownish yellowish (10YR 6/8) mottles; weak medium subangular blocky structure; friable; few fine roots; very strongly acid; clear wavy boundary.

Bx1—30 to 45 inches; mottled gray (10YR 6/1), light yellowish brown (2.5Y 6/4), and yellowish brown (10YR 5/8) silt loam; moderate coarse prismatic structure parting to weak medium subangular blocky; firm; brittle in about 65 percent of mass; few fine roots in gray seams between prisms; very strongly acid; gradual smooth boundary.

Bx2—45 to 60 inches; gray (10YR 6/1) silt loam; many medium distinct light olive brown (2.5Y 5/6) mottles; moderate coarse prismatic structure parting to weak medium subangular blocky; firm; brittle in about 60 percent of mass; very strongly acid.

The thickness of the solum exceeds 60 inches. The depth to the fragipan ranges from 20 to 40 inches. Reaction is strongly acid or very strongly acid in each horizon. The content of chert fragments and pebbles ranges from 0 to 5 percent by volume above the fragipan and from 0 to 15 percent in the fragipan.

The A horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 to 4.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 or less, and it has few to common mottles in shades of brown. It is silt loam or light silty clay loam.

The Bx horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or less, and it has few to many mottles in shades of gray, brown, and yellow. It is silt loam or silty clay loam.

Hamblen series

The Hamblen series consists of deep, moderately well drained, nearly level soils that formed in alluvial sediment along streams and drainageways. Slopes are dominantly less than 2 percent, but range up to 3 percent.

Hamblen soils are on the same landscape as Staser and Newark soils. The Staser soils differ from the Hamblen soils mainly by being well drained, and the Newark soils differ by being somewhat poorly drained.

Typical pedon of Hamblen silt loam in an area 0.1 mile west of Robinson crossroads, 200 feet on right along stream:

Ap—0 to 10 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many fine and medium roots; slightly acid; clear smooth boundary.

B21—10 to 18 inches; brown (10YR 4/3) silt loam; moderate medium granular and weak fine subangular blocky structure; friable; many fine roots; slightly acid; gradual wavy boundary.

B22—18 to 32 inches; brown (10YR 4/3) silt loam; common fine faint light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) mottles; weak fine subangular blocky structure; friable; common fine roots; slightly acid; gradual wavy boundary.

C—32 to 60 inches; brown (10YR 4/3) silt loam; common medium faint light brownish gray (10YR 6/2) and dark brown (10YR 3/3) mottles; massive; friable; slightly acid.

The thickness of the solum ranges from 20 to 50 inches, and the depth to bedrock is greater than 60 inches. Reaction ranges from neutral to strongly acid. The content of coarse fragments ranges from 0 to 10 percent in the solum and from 0 to 20 percent in the C horizon.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. It is silt loam or loam.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 8. Mottles of chroma of 2 or less are within 20 inches of the surface. Texture is silt loam or loam.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 1 to 4. It has common or many mottles in shades of gray, brown, and yellow and is mottled without a dominant color in some pedons. Texture is silt loam or loam.

Hanceville series

The Hanceville series consists of deep, well drained, moderately steep and steep soils that formed in residuum of sandstone. These soils are on side slopes and benches of White Oak Mountain. Slopes range from 12 to 40 percent.

Hanceville soils are on the same landscape as Enders, Montevallo, and Armuchee soils. Enders soils differ from the Hanceville soils mainly by having shale bedrock at a depth of less than 60 inches. Montevallo soils are loamy-skeletal and are less than 20 inches deep to shale bedrock. Armuchee soils have a thin argillic horizon 10 inches or less in thickness and are less than 40 inches to bedrock.

Typical pedon of Hanceville loam, 12 to 25 percent slopes, 1 mile west of Collegedale on White Oak Mountain, on Radio Tower Road, 100 feet south of road:

Ap—0 to 6 inches; dark reddish brown (5YR 3/4) loam; moderate medium granular structure; friable; common fine and medium roots; strongly acid; clear smooth boundary.

B21t—6 to 20 inches; dark red (10R 3/6) clay; weak medium subangular blocky structure; friable; common fine roots; thin discontinuous clay films; 5 percent by volume fragments of sandstone less than 2 inches across; strongly acid; gradual wavy boundary.

B22t—20 to 36 inches; dark red (10R 3/6) clay; moderate medium subangular blocky structure; friable; common fine roots; thin discontinuous clay films; 5 percent by volume fragments of sandstone less than 2 inches across; strongly acid; gradual wavy boundary.

B23t—36 to 52 inches; dark red (10R 3/6) clay loam; weak medium subangular blocky structure; friable; thin discontinuous clay films; 5 percent by volume fragments of sandstone less than 2 inches across; very strongly acid; gradual wavy boundary.

B3—52 to 64 inches; dark red (10R 3/6) clay loam; weak fine subangular blocky structure; friable; 10 percent by volume sandstone fragments 1 inch to 5 inches across; strongly acid; gradual wavy boundary.

R—64 inches; red broken sandstone; partially weathered, with some sandy loam material in cracks.

The thickness of the solum ranges from 50 to 62 inches and the depth to bedrock is 60 inches or more. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed. The content of coarse fragments ranges from 0 to 10 percent by volume throughout.

The Ap horizon has hue of 5YR or 7.5YR, value of 3, and chroma of 2 to 4.

The B2t and B3 horizons have hue of 2.5YR or 10R, value of 3 or 4, and chroma of 4 or 6. The B3 horizon also has value of 5. The B horizon is clay loam, sandy clay, or clay.

The upper few inches of the R horizon is weakly cemented red, yellow, or brown sandstone that becomes harder as depth increases.

Holston series

The Holston series consists of deep, well drained, gently sloping to moderately steep soils that formed in thick deposits of old alluvium. Slopes range from 2 to 20 percent.

Holston soils are on the same landscape as Waynesboro and Etowah soils. The Waynesboro soils have a clayey subsoil. The Etowah soils have more silt throughout the solum and have redder hues in the B horizon than the Holston soils.

Typical pedon of Holston loam, 2 to 6 percent slopes, 1/2 mile north of the intersection of Birchwood Pike and Grasshopper Road on Birchwood Pike; take first road to left 800 feet; 200 feet on left of road:

Ap—0 to 8 inches; brown (10YR 5/3) loam; moderate fine granular structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

B21t—8 to 15 inches; yellowish brown (10YR 5/8) loam; weak fine subangular blocky structure; friable; few fine medium roots; thin discontinuous clay films; strongly acid; gradual smooth boundary.

B22t—15 to 25 inches; yellowish brown (10YR 5/8) clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films; strongly acid; gradual smooth boundary.

B23t—25 to 60 inches; strong brown (7.5YR 5/8) clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films; strongly acid; gradual smooth boundary.

B3—60 to 75 inches; strong brown (7.5YR 5/6) clay loam; common fine and medium distinct pale brown (10YR 6/3) and yellowish red (5YR 5/6) mottles; weak medium subangular blocky structure; friable; thin discontinuous clay films; few small black concretions; strongly acid.

The thickness of the solum is more than 60 inches. The depth to bedrock ranges from 5 feet to more than 10 feet. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed. The content of coarse fragments ranges from 0 to 15 percent by volume in the A and B2 horizons and from 0 to 35 percent in the B3 horizon.

The Ap horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. Texture is loam or silt loam.

The B horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 to 8. Texture is loam, clay loam, or silty clay loam. Below 40 inches this horizon also has hue of 5YR, value of 4 or 5, and chroma of 6 or 8, and is mottled with shades of brown, red, yellow, or gray in many pedons.

Humphreys series

The Humphreys series consists of deep, well drained, gently sloping cherty soils that formed in alluvium. These soils are on stream terraces and foot slopes of ridges. Slopes range from 1 to 6 percent.

Humphreys soils are on the same landscape as the Minvale and Roane soils. The Minvale soils have a thicker solum and a lighter colored surface layer than the Humphreys soils. The Roane soils are moderately well drained and have a fragipan.

Typical pedon of Humphreys cherty silt loam, 1 to 6 percent slopes, 1/8 mile from intersection of Hixson Pike on Daisy Road, 100 feet on right:

Ap—0 to 7 inches; dark brown (10YR 3/3) cherty silt loam; weak fine granular structure; friable; common fine roots; 15 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; clear smooth boundary.

B1—7 to 10 inches; dark yellowish brown (10YR 4/4) cherty silt loam; moderate medium granular and weak fine subangular blocky structure; friable; common fine roots; 20 percent by volume fragments of chert 1/4 inch to 1 inch across; strongly acid; gradual smooth boundary.

B21t—10 to 16 inches; dark yellowish brown (10YR 4/4) cherty silt loam; moderate fine and medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films; 30 percent by volume fragments of chert 1/4 to 1 inch across; strongly acid; gradual smooth boundary.

B22t—16 to 28 inches; strong brown (7.5YR 5/6) cherty silty clay loam; few fine faint yellowish brown (10YR 5/6) and pale brown (10YR 6/3) mottles; weak medium subangular blocky structure; friable; thin discontinuous clay films; few fine black concretions; 30 percent by volume fragments of chert 1/4 inch to 1 inch across; strongly acid; gradual smooth boundary.

B23t—28 to 60 inches; strong brown (7.5YR 5/6) cherty silty clay loam; few fine faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; thin discontinuous clay films; 35 percent by volume of fragments of chert 1/4 inch to 1 inch across; strongly acid.

The thickness of the solum ranges from about 30 to 60 inches. Reaction is strongly acid throughout, except in areas where the surface layer has been limed. The content of chert fragments or gravel ranges from 15 to 35 percent in each horizon.

The Ap horizon has hue of 7.5YR or 10YR, value of 3, and chroma of 2 to 4. It is cherty silt loam or cherty loam.

The B horizon has hue of 10YR, 7.5R, or 5YR, value of 4 or 5, and chroma of 4 or 6. It is cherty silt loam or cherty silty clay loam.

Lily series

The Lily series consists of moderately deep, well drained, gently sloping to moderately steep soils that formed in residuum of shale and sandstone. These soils are on the tops of White Oak, Grindstone, and Cumberland Mountains. Slopes range from 2 to 20 percent.

Lily soils are on the same landscape as Lonewood and Gilpin soils. Lonewood soils are deeper than 40 inches to bedrock and have less sand in the upper part of the solum than do the Lily soils. Gilpin soils have a higher silt content, less sand, and more rock fragments.

Typical pedon of Lily loam, 2 to 7 percent slopes, 3 miles west of the town of Signal Mountain on Edwards Point Road, at road intersection; 100 feet on gravel road and 100 feet on right:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) loam; weak medium granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

A2—3 to 6 inches; pale brown (10YR 6/3) loam; weak medium granular structure; very friable; common fine roots; strongly acid; clear smooth boundary.

B1—6 to 12 inches; yellowish brown (10YR 5/4) loam; weak fine subangular blocky structure; very friable; few fine roots; strongly acid; gradual smooth boundary.

B21t—12 to 20 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films; strongly acid; gradual smooth boundary.

B22t—20 to 30 inches; yellowish brown (10YR 5/8) clay loam; weak medium subangular blocky structure; friable; thin discontinuous clay films; very strongly acid; gradual smooth boundary.

B3—30 to 37 inches; yellowish brown (10YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; 10 percent by volume fragments of sandstone 1/2 to 1 inch across; very strongly acid.

R—37 inches; acid sandstone.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed. The content of sandstone fragments ranges from 0 to 10 percent to a depth of 24 inches and from 0 to 20 percent below 24 inches.

The A1 horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. The A2 or Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. Texture of the A horizon is loam or fine sandy loam.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. Texture of the B1 horizon is loam, fine sandy loam, or sandy loam. The B2t horizon has texture of clay loam, sandy clay loam, or loam; and texture of the B3 horizon ranges from sandy loam to clay loam.

Lobelville series

The Lobelville series consists of deep, moderately well drained, nearly level soils that formed in cherty alluvium along streams and in depressions. Slopes are dominantly less than 2 percent but range up to 3 percent.

Lobelville soils are on the same landscape as Ennis and Roane soils. Unlike the Lobelville soils, the Ennis soils are well drained. The Roane soils are moderately well drained and have a fragipan.

Typical pedon of Lobelville cherty silt loam, east of Bakewell 1.7 miles on Daughtery Ferry Road, right on county road 0.7 mile, right on county road 0.8 mile, on right side of road 100 yards along drainageway:

Ap—0 to 10 inches; brown (10YR 4/3) cherty silt loam; weak fine granular structure; friable; common fine and medium roots; 25 percent by volume fragments of chert; strongly acid; gradual smooth boundary.

B21—10 to 17 inches; brown (10YR 4/3) cherty silt loam; few fine faint light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; common fine and medium roots; 25 percent by volume fragments of chert; strongly acid; gradual wavy boundary.

B22—17 to 25 inches; brown (10YR 5/3) cherty silt loam; common fine faint light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; few fine roots; 25 percent by volume fragments of chert; strongly acid; gradual wavy boundary.

B23—25 to 45 inches; brown (10YR 5/3) cherty silt loam; common medium faint light brownish gray (2.5Y 6/2) and light gray (10YR 7/2) mottles; weak fine subangular blocky structure; friable; few fine roots; 30 percent by volume fragments of chert; strongly acid; gradual wavy boundary.

Cg—45 to 62 inches; light brownish gray (2.5Y 6/2) very cherty silt loam; many medium faint brown (10YR 5/3) and common fine faint light yellowish brown (10YR 6/4) mottles; massive; friable; 50 percent by volume fragments of chert; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to bedrock ranges from 5 to 12 or more feet. The content of chert fragments in the upper 40 inches of the soil ranges from 15 percent to 30 percent by volume. Fragments are 1/4 inch to 2 inches in diameter. The content of chert fragments in the lower part of the soil ranges from 15 to 60 percent. Reaction is strongly acid, except in areas where the surface layer has been limed.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 3.

The B horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 4. It has common to many mottles in shades of gray and brown. The fine earth fraction is loam, silt loam, or silty clay loam.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 to 4. It has mottles in shades of gray and brown. The fine earth fraction is loam, silt loam, or silty clay loam.

Lonewood series

The Lonewood series consists of deep, well drained, nearly level and gently sloping soils that formed in residuum of shale and sandstone. These soils are on broad plateaus and ridgetops of the Cumberland Mountains. Slopes range from 2 to 6 percent.

Lonewood soils are on the same landscape as Lily and Ramsey soils. Lily soils are less than 40 inches to bedrock and have a higher sand content than the Lonewood soils. Ramsey soils are less than 20 inches to sandstone bedrock.

Typical pedon of Lonewood silt loam, 2 to 6 percent slopes, on Sale Creek Road, 1 mile from Bledsoe County line, 100 feet on right of road, across from cemetery:

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine granular structure; very friable; many fine roots; strongly acid; abrupt smooth boundary.

A2—3 to 9 inches; yellowish brown (10YR 5/4) silt loam; moderate medium granular structure; very friable; many fine roots; strongly acid; clear smooth boundary.

B21t—9 to 25 inches; yellowish brown (10YR 5/6) silt loam; weak fine subangular blocky structure; friable; many fine roots; thin discontinuous clay films; strongly acid; clear smooth boundary.

B22t—25 to 32 inches; yellowish brown (10YR 5/8) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films; strongly acid; clear smooth boundary.

B23t—32 to 65 inches; yellowish red (5YR 5/8) silty clay loam; moderate medium subangular blocky structure; friable; thin discontinuous clay films; strongly acid; clear smooth boundary.

C—65 to 70 inches; mottled light yellowish brown (10YR 6/4), strong brown (7.5YR 5/6), and red (2.5YR 5/8) very shaly clay loam; weak platy structure; firm; 60 percent by volume fragments of shale 1/4 inch to 1/2 inch across; strongly acid.

R—70 inches; hard shale rock.

The thickness of the solum ranges from 40 to 65 inches. The depth to hard shale or sandstone rock ranges from 40 to 72 inches. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed. The content of rock fragments ranges from 0 to 5 percent in the A horizon and the upper part of the B horizon, from 0 to 10 percent in the lower part of the B horizon, and from 10 to 65 in the C horizon.

The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2. The A2 or Ap horizon has hue of 10YR, value of 4 through 6, and chroma of 3 or 4. Texture is silt loam or loam.

The B21t and B22t horizons have hue of 10YR, 7.5YR, or 5YR, value of 5, and chroma of 4 to 8. Texture is silt loam, silty clay loam, or clay loam. The B23t horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is silty clay loam or clay loam.

The C horizon has colors similar to those of the B23t horizon or is mottled in shades of brown and red. Texture of the fine earth fraction is clay loam, loam, or silty clay loam.

Minvale series

The Minvale series consists of deep, well drained, gently sloping to moderately steep soils that formed in colluvium from cherty limestone. Minvale soils are on foot slopes and benches. Slopes range from 3 to 20 percent.

Minvale soils are on the same landscape as Fullerton, Holston, and Humpreys soils. Fullerton soils have more than 35 percent clay in the upper 20 inches of the argillic horizon. Holston soils contain less than 15 percent rock fragments in each horizon. Humphreys soils are on terraces and have a thinner solum than Minvale soils.

Typical pedon of Minvale silt loam, 3 to 12 percent slopes, 1 1/2 miles south of county park on South Gold Point Road, 100 feet on left of road:

A1—0 to 1 inch; grayish brown (10YR 5/2) cherty silt loam; weak fine granular structure; friable; many fine roots; 15 percent by volume fragments of chert 1/4 inch to 1/2 inch across; strongly acid; clear smooth boundary.

A2—1 to 6 inches; yellowish brown (10YR 5/4) cherty silt loam; weak fine granular structure; friable; many fine roots; 15 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; clear smooth boundary.

B1—6 to 18 inches; strong brown (7.5YR 5/6) cherty silt loam; weak fine subangular blocky structure; friable; few fine roots; 15 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; gradual smooth boundary.

B21t—18 to 29 inches; yellowish red (5YR 4/8) cherty silty clay loam; weak medium subangular blocky structure; friable; few fine roots; few discontinuous clay films; 15 percent by volume fragments of chert 1 inch to 2 inches across; strongly acid; gradual smooth boundary.

B22t—29 to 37 inches; yellowish red (5YR 4/8) cherty silty clay loam; moderate medium angular blocky

structure; friable; few thin discontinuous clay films; 20 percent by volume fragments of chert 1 inch to 2 inches across; strongly acid; gradual smooth boundary.

B23t—37 to 50 inches; yellowish red (5YR 4/8) cherty silty clay loam; moderate medium angular blocky structure; friable; few thin continuous clay films; 20 percent by volume fragments of chert 1 inch to 2 inches across; strongly acid; gradual smooth boundary.

B24t—50 to 60 inches; yellowish red (5YR 5/8) cherty silty clay loam; moderate medium angular blocky structure; firm; few thin discontinuous clay films; 35 percent by volume fragments of chert 1 inch to 2 inches across; strongly acid.

The thickness of the solum and the depth to bedrock are greater than 60 inches. Reaction is strongly acid or very strongly acid, except in areas where the surface has been limed. The content of coarse fragments ranges from 10 to 35 percent in the A horizon and from 15 to 35 percent in the B horizon.

The A horizon has hue of 10YR or 7.5YR, value of 4 to 5, and chroma of 2 to 4.

The B horizon has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 6 or 8. The fine earth fraction of the B1 and B21t horizons is silt loam or silty clay loam, and that of the B22t, B23t, and B24t horizons is silty clay loam or silty clay.

Montevallo series

The Montevallo series consists of shallow, well drained, steep soils that formed in materials weathered from shale or siltstone. These soils are on side slopes of ridges and narrow ridgetops. Slopes range from 20 to 45 percent.

Montevallo soils are on the same landscape as Armuchee and Enders soils. Armuchee soils differ from Montevallo soils mainly by having a thin clayey argillic horizon and a depth to bedrock which ranges from 20 to 40 inches. Enders soils have a thick clayey argillic horizon and are more than 40 inches to bedrock.

Typical pedon of Montevallo shaly silt loam, 20 to 45 percent slopes, 2 miles south of Collegedale on Radio Tower Road at foot of mountain, left on private road 1/8 mile, 250 feet on left at borrow pit:

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) shaly silt loam; weak fine granular structure; friable; 25 percent by volume fragments of shale 1/4 inch to 1/2 inch across; many fine roots; very strongly acid; clear smooth boundary.

B—6 to 18 inches; light yellowish brown (10YR 6/4) very shaly silt loam; weak fine and medium subangular blocky structure; friable; few large roots; 60 percent by volume fragments of shale 1/4 inch to 1 inch across; very strongly acid; gradual wavy boundary.

Cr—18 to 28 inches; light yellowish brown (10YR 6/4) weakly cemented shale; contains about 5 percent by volume fines as coatings in cracks and on shale fragments.

The thickness of the solum and the depth to weakly cemented silty shale range from 10 to 20 inches. The A horizon contains 15 to 40 percent by volume shale fragments, and the B horizon contains 35 to 85 percent shale fragments. Reaction is strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 6, and chroma of 2 to 4.

The B horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. The fine earth fraction is silt loam or silty clay loam.

Nesbitt series

The Nesbitt series consists of deep, moderately well drained soils on foot slopes, terraces, and a few upland flats. These soils formed mostly in silty alluvium weathered from siltstone and shale and in the underlying clayey residuum of limestone. Some pedons formed in silty residuum of siltstone and shale. Slopes range from 2 to 6 percent.

Nesbitt soils are on the same landscape as Enders and Woodmont soils. Enders soils are on higher-lying upland slopes than the Nesbitt soils and have a clayey subsoil. Woodmont soils are on nearly level, lower-lying areas and are somewhat poorly drained.

Typical pedon of Nesbitt silt loam near Harrison Bay Park road, 1 mile east of park on road to cemetery, 100 feet from road on left side:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; common fine and medium roots; medium acid; clear smooth boundary.

B1—9 to 16 inches; yellowish brown (10YR 5/6) silt loam with dark yellowish brown (10YR 4/4) ped faces; weak fine subangular blocky structure; friable; common fine and medium roots; medium acid; gradual smooth boundary.

B21t—16 to 22 inches; yellowish brown (10YR 5/6) silty clay loam; few fine faint pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; common fine roots; thin discontinuous clay films on faces of peds; few fine black concretions; strongly acid; gradual smooth boundary.

B22t—22 to 27 inches; yellowish brown (10YR 5/6) silty clay loam; common fine faint light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films on faces of peds; few fine black concretions; strongly acid; gradual wavy boundary.

B23t—27 to 45 inches; yellowish brown (10YR 5/6) silty clay loam; common medium faint light brownish gray (10YR 6/2), pale brown (10YR 6/3), and strong brown (7.5YR 5/6) mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; thin discontinuous clay films on faces of peds; many fine black concretions; strongly acid.

I IB3—45 to 60 inches; light yellowish brown (10YR 6/4) silty clay; common medium strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; firm; few fine roots; few fine black concretions; strongly acid.

The thickness of the solum and the depth to bedrock range from 60 to 72 inches. Reaction ranges from medium acid to strongly acid, except in areas where the surface layer has been limed and in the layer just above limestone bedrock where it ranges to mildly alkaline. The content of small rock fragments less than 2 inches across ranges from 0 to 5 percent by volume in each horizon except in the layer just above bedrock, where it ranges to 10 percent.

The Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. Some pedons have a thin A1 horizon which has value of 3 or 4 and chroma of 2 or 3. Some pedons have an A2 horizon which has the same colors as the Ap horizon.

The B1 horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 or 6.

The B2t horizon has hue of 10YR or 7.5YR, value of 5 or 6, and chroma of 4 or 8. Mottles in shades of brown and gray range from few to many below the upper 10 inches of this horizon. Texture is silt loam or silty clay loam.

The IIB horizon has hue of 10YR, 7.5YR, or 5YR, value of 5 or 6, and chroma of 4 to 8. It is mottled in shades of gray and brown. Texture is silty clay loam, silty clay, or clay. In some pedons, a IIC horizon having colors and textures similar to those in the IIB horizon is present.

The Nesbitt soils in this county are taxadjuncts to the Nesbitt series. They have a lighter colored A horizon and are in a different physiographic area than defined for the series, but these differences do not affect the use and management of these soils.

Newark series

The Newark series consists of deep, somewhat poorly drained, nearly level soils that formed in mixed alluvium on flood plains. Slopes range from 0 to 3 percent.

Newark soils are on the same landscape as Staser and Hamblen soils. Unlike the Newark soils, the Staser soils are well drained and have a thick dark surface layer. The Hamblen soils are moderately well drained.

Typical pedon of Newark silt loam in an area 500 feet south of Mountain Creek Apartments off Mountain Creek Road:

Ap—0 to 6 inches; dark grayish brown (2.5Y 4/2) silt loam; few fine faint light yellowish brown (10YR 6/4) mottles; weak fine granular structure; friable; common fine and medium roots; mildly alkaline; gradual smooth boundary.

B21—6 to 14 inches; brown (10YR 5/3) silt loam; common fine distinct light brownish gray (10YR 6/2) mottles; moderate medium granular structure; friable; common medium roots; mildly alkaline; gradual smooth boundary.

B22g—14 to 18 inches; grayish brown (10YR 5/2) silt loam; common medium distinct light yellowish brown (10YR 6/4) mottles; few fine roots; friable; moderate medium granular structure; mildly alkaline; gradual smooth boundary.

B23g—18 to 30 inches; gray (10YR 5/1) silt loam; common medium distinct strong brown (7.5YR 5/6) and light gray (10YR 7/2) mottles; weak fine subangular blocky structure; friable; mildly alkaline; gradual smooth boundary.

C1g—30 to 36 inches; gray (10YR 5/1) silt loam; common medium distinct light gray (10YR 7/2), strong brown (7.5YR 5/6), and brown (10YR 5/3) mottles; massive; friable; mildly alkaline; gradual smooth boundary.

C2g—36 to 60 inches; gray (10YR 5/1) loam; common medium distinct very pale brown (10YR 7/3), yellowish brown (10YR 5/6), and strong brown (7.5YR 5/6) mottles; massive; friable; mildly alkaline.

The thickness of the solum ranges from 25 to 40 inches. The content of coarse fragments ranges from 0 to about 5 percent by volume in each horizon. Reaction ranges from slightly acid to mildly alkaline.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 through 4. It is loam or silt loam.

The B21 horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 through 4.

The B22g horizon has hue of 2.5Y or 10YR, value of 4 to 7, and chroma of 0 to 2. It is silt loam or silty clay loam.

The Cg horizon has the same colors as the B22g horizon. Texture is loam, silt loam, or silty clay loam.

The Newark soils in this county are a taxadjunct to the Newark series. They have a slightly warmer soil temperature than is defined for the series, but this difference does not affect the use and management of these soils.

Ramsey series

The Ramsey series consists of shallow, somewhat excessively drained, sloping to very steep soils of the Cumberland Mountains. These soils formed in material weathered from shale. Slopes range from 8 to 70 percent.

The Ramsey soils are on the same landscape as Sequoia, Gilpin, and Lily soils. The Gilpin and Lily soils

are deeper to bedrock than the Ramsey soils and have an argillic horizon. The Sequoia soils have a clayey argillic horizon and are deeper to bedrock.

Typical pedon of Ramsey loam, 8 to 25 percent slopes, on Signal Mountain 237 feet NW of the end of Morrell Road:

A1—0 to 1 inch; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; common fine roots; strongly acid; abrupt smooth boundary.

A2—1 to 8 inches; brown (10YR 5/3) loam; moderate medium granular structure; very friable; common fine and medium roots; 3 percent by volume fragments of sandstone 1/8 inch to 1/2 inch across; strongly acid; clear smooth boundary.

B2—8 to 14 inches; yellowish brown (10YR 5/6) loam; moderate medium subangular blocky structure; friable; common medium roots; 5 percent by volume fragments of sandstone 1/8 inch to 1/2 inch across; strongly acid; clear smooth boundary.

B3—14 to 16 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable; strongly acid.

R—16 inches; sandstone.

The thickness of the solum and the depth to bedrock range from 7 to 20 inches. The content of sandstone fragments 1/8 inch to 6 inches across ranges from 0 to 35 percent in each horizon. Reaction is strongly acid or very strongly acid.

The A1 horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3.

The A2 horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. The fine earth fraction is loam, fine sandy loam, or sandy loam.

The B horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. The fine earth fraction is loam or sandy loam. Some pedons have a thin C horizon which has colors similar to those of the B horizon and textures that range from loam to loamy sand.

Roane series

The Roane series consists of deep, moderately well drained, nearly level to sloping, cherty soils which have a fragipan. These soils formed in alluvium that derived from soils underlain by cherty limestone. Roane soils are along drainageways on the flood plains of small streams and on foot slopes and terraces. Slopes range from 0 to 12 percent.

Roane soils are on the same landscape as Ennis, Humphreys, and Lobelville soils. Unlike the Roane soils, the Ennis and Lobelville soils do not have a fragipan. The Humphreys soils are on foot slopes and terraces and are well drained.

Typical pedon of Roane cherty loam, 0 to 2 percent slopes, 0.3 mile south of Midway Church, 150 feet west of ford in creek:

Ap—0 to 6 inches; brown (10YR 4/3) cherty loam; moderate medium granular structure; very friable; many fine roots; 20 percent by volume fragments of chert 1/4 inch to 3 inches across; few fine dark brown concretions; strongly acid; clear smooth boundary.

B2—6 to 20 inches; brownish yellow (10YR 6/6) cherty loam; few fine faint strong brown mottles; weak medium and fine subangular blocky structure; friable; common fine roots; 25 percent by volume fragments of chert 1/4 inch to 3 inches across; strongly acid; gradual wavy boundary.

Bx&A—20 to 35 inches; light yellowish brown (10YR 6/4) cherty clay loam; many fine to coarse distinct strong brown (7.5YR 5/6), very pale brown (10YR 7/3), and light brownish gray (10YR 6/2) mottles; coarse prisms separated by tapered wedges of mottled gray silt loam 1/4 inch to 2 inches wide; prisms part into weak medium platy and subangular blocky peds; very firm and brittle in about 80 percent of the cross section; weakly cemented; few fine roots in seams; thin discontinuous clay films on the faces of peds; 50 percent by volume angular and rounded fragments of chert 1/4 inch to 3 inches across; few quartzite pebbles; strongly acid.

Bx2—35 to 60 inches; very pale brown (10YR 7/3) cherty clay loam; common medium distinct strong brown (7.5YR 5/6), red (2.5YR 4/8), and light brownish gray (10YR 6/2) mottles; weak coarse prisms 3 to 8 inches across separated by tapered wedges of gray silt loam; prisms part to weak medium and coarse platy and subangular blocky structure; firm, brittle, and weakly cemented in about 80 percent of the cross section; few fine roots in wedges; few veins of grayish clay and thin discontinuous clay films on peds within prisms; 65 percent by volume angular and partly rounded fragments of chert less than 3 inches across; few quartzite pebbles; strongly acid.

The depth to the fragipan ranges from about 15 to 40 inches. The content of angular fragments of chert and rounded pebbles ranges from about 15 to 30 percent by volume in the layers above the fragipan and from 35 to 65 percent in the fragipan. The fragments are normally less than 3 inches in diameter, but some are larger. The soil is strongly acid throughout, except in areas where the surface layer has been limed. The depth to bedrock is greater than 60 inches.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The fine earth fraction is silt loam or loam.

The B2 horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 4 to 6. The fine earth fraction is loam, silt loam, silty clay loam, or clay loam.

The Bx horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 3 to 6. It is mottled in shades of yellow, brown, red, and gray. It has the same texture range as the B2 horizon.

Sequatchie series

The Sequatchie series consists of deep, well drained, gently sloping soils that formed in thick deposits of loamy alluvium on stream terraces, alluvial fans, and benches below steep ridges. Slopes are dominantly less than 5 percent but range from 2 to 7 percent.

Sequatchie soils are on the same landscape as the Etowah and Whitwell soils. The Etowah soils have a thicker solum and a redder subsoil than the Sequatchie soils. The Whitwell soils are moderately well drained.

Typical pedon of Sequatchie loam, 2 to 7 percent slopes, 2 miles northeast of Friendsville, 2 miles to right on Harmon Farm Road, 500 feet on left:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) loam; weak fine granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

B1—9 to 21 inches; brown (7.5YR 4/4) loam; weak fine subangular blocky structure; very friable; many fine roots; strongly acid; clear smooth boundary.

B2t—21 to 46 inches; yellowish brown (10YR 5/6) clay loam; weak fine subangular blocky structure; friable; few fine roots; few thin discontinuous clay films; strongly acid; gradual smooth boundary.

C—46 to 61 inches; yellowish brown (10YR 5/6) loam; few fine faint strong brown (7.5YR 5/6) mottles; massive; strongly acid.

The thickness of the solum ranges fom 35 to 55 inches. The depth to bedrock is more than 60 inches. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed. The content of pebbles ranges from 0 to 15 percent in the solum and from 0 to 30 percent in the C horizon.

The Ap horizon has hue of 10YR or 7.5YR, value of 3, and chroma of 2 to 4. Texture is loam or fine sandy loam.

The B1 horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. Texture is loam, fine sandy loam, or silt loam. The B2t horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. Texture is clay loam, silt loam, or loam. In some pedons, the horizon is mottled in the lower part in shades of brown.

The C horizon has hue of 10YR or 7.5YR, value of 5, and chroma of 4 to 6. It has few to many mottles in shades of brown and gray. Texture is loam, fine sandy loam, or sandy loam.

Sequoia series

The Sequoia series consists of moderately deep, well drained, sloping to moderately steep soils on shale ridges of the Cumberland Mountains. These soils formed in residuum of acid shale. Slopes range from 8 to 20 percent.

The Sequoia soils are on the same landscape as the Gilpin and Lily soils. The Lily soils differ from the Sequoia soils mainly by having a loamy subsoil, and they are less than 40 inches to hard sandstone bedrock. The Gilpin soils have a loamy subsoil and are less than 40 inches to rippable shale.

Typical pedon of Sequoia silt loam, 8 to 20 percent slopes, 3 miles north of Bakewell on mountain road, 100 feet on left of road at the top of the mountain:

A1—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; common fine and medium roots; strongly acid; clear smooth boundary.

B1—5 to 10 inches; yellowish brown (10YR 5/8) silty clay loam; weak medium granular structure; common fine and medium roots; strongly acid; clear smooth boundary.

B21t—10 to 22 inches; yellowish red (5YR 5/6) silty clay; weak fine angular blocky structure; few fine roots; thin discontinuous clay films; strongly acid; gradual smooth boundary.

B22t—22 to 30 inches; yellowish red (5YR 5/8) clay; moderate fine angular blocky structure; firm; thin continuous clay films; strongly acid; gradual smooth boundary.

B23t—30 to 36 inches; yellowish red (5YR 5/8) clay; few fine distinct pale olive (5Y 6/3) mottles; moderate fine angular blocky structure; firm; 10 percent by volume small fragments of shale; thin continuous clay films; strongly acid.

Cr—36 to 50 inches; soft shale; about 10 percent fine earth in cracks and as coatings on fragments.

The depth to rock and the thickness of the solum range from 20 to 40 inches. Reaction is strongly acid or very strongly acid, except in areas where the surface layer has been limed. Rock fragments make up from 0 to 20 percent of the B horizon.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 through 6.

The B1 horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. Texture is silt loam or silty clay loam. The B2t horizon has hue of 10YR, 7.5YR or 5YR, value of 5, and chroma of 6 or 8. Texture is silty clay or clay. Some pedons have a B3 horizon, which has the same colors and textures as the lower part of the B2t horizon.

Sewanee Variant

The Sewanee Variant consists of moderately deep, moderately well drained, nearly level soils along drainageways and in depressions of the Cumberland Mountains. These soils formed in alluvium and colluvium from acid sandstone and shale. Slopes range from 0 to 3 percent.

Sewanee Variant soils are on the same landscape as Lily and Lonewood soils, which are on the adjacent uplands. The Lily soils are loamy, moderately deep, and well drained. The Lonewood soils are deep, loamy, and well drained.

Typical pedon of Sewanee Variant silt loam on Bakewell Mountain, 2 miles south of the Bledsoe County line, on the east side of stream and 200 feet north of road:

A1—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam; moderate medium granular structure; friable; common fine and medium roots; very strongly acid; abrupt smooth boundary.
A2—3 to 7 inches; light yellowish brown (10YR 6/4) silt loam; moderate medium granular structure; friable; common fine and medium roots; very strongly acid; clear smooth boundary.
B21—7 to 12 inches; light yellowish brown (10YR 6/4) silt loam; weak fine subangular blocky structure; friable; common fine and medium roots; very strongly acid; clear smooth boundary.
B22—12 to 22 inches; yellowish brown (10YR 5/6) silt loam; common medium and distinct strong brown (7.5YR 5/6) and light brownish gray (10YR 6/2) mottles; moderate fine subangular blocky structure; friable; few fine roots; very strongly acid; clear smooth boundary.
B3—22 to 28 inches; mottled light brownish gray (2.5Y 6/2), light yellowish brown (10YR 6/4), and yellowish brown (10YR 5/6) silt loam; thin weak coarse platy structure breaking to weak fine subangular blocky; friable; very strongly acid.
R—28 inches; sandstone bedrock.

The thickness of the solum and the depth to bedrock range from 20 to 40 inches. Reaction is strongly acid or very strongly acid. Rock fragments make up from 0 to 15 percent of each horizon.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. It is strongly acid or very strongly acid except in areas where the surface layer has been limed. Texture is silt loam or loam.

The B2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. The lower part is mottled in shades of brown and gray. Texture is silt loam or loam.

The B3 horizon has hue of 2.5Y or 10YR, value of 5 or 6, and chroma of 2 to 6. Many pedons are mottled without a dominant color. Texture is silt loam, loam, or fine sandy loam.

Shack series

The Shack series consists of deep, moderately well drained, sloping and moderately steep soils on uplands underlain by limestone. These soils formed in cherty residuum of limestone and have a compact, slowly permeable layer in the subsoil. Slopes range from 5 to 25 percent.

The Shack soils are on the same landscape as Bodine, Fullerton, and Minvale soils. The Fullerton soils are well drained and have a clayey subsoil. The Bodine soils contain more chert than the Shack soils and are well drained. The Minvale soils are well drained and friable.

Typical pedon of Shack cherty silt loam in a wooded area of Bodine-Shack complex, 5 to 25 percent slopes, U.S. Highway 27 north to Red Bank, 1/8 mile on right of street at top of ridge, 50 feet east of intersection:

A1—0 to 1 inch; grayish brown (10YR 5/2) cherty silt loam; weak fine granular structure; friable; many fine and medium roots; 20 percent by volume fragments of chert 1/4 inch to 1/2 inch across; strongly acid; clear wavy boundary.
A2—1 to 5 inches; light yellowish brown (10YR 6/4) cherty silt loam; weak fine granular structure; friable; common fine and medium roots; 15 percent by volume fragments of chert 1/4 inch to 1/2 inch across; strongly acid; clear wavy boundary.
B1—5 to 9 inches; light yellowish brown (10YR 6/4) cherty silt loam; weak fine subangular blocky structure; friable; common fine roots; 15 percent by volume fragments of chert 1/4 inch to 1/2 inch across; strongly acid; clear wavy boundary.
B21t—9 to 21 inches; yellowish brown (10YR 5/6) cherty silty clay loam; moderate fine and medium subangular blocky structure; friable; few fine roots; 25 percent by volume fragments of chert 1/4 inch to 1/2 inch across; strongly acid; clear wavy boundary.
B22t—21 to 31 inches; mottled brownish yellow (10YR 6/8) and light brownish gray (2.5Y 6/2) cherty silty clay loam; moderate medium subangular blocky structure; firm; 35 percent by volume fragments of chert 1/4 inch to 1/2 inch across; strongly acid; clear wavy boundary.
B23t—31 to 51 inches; strong brown (7.5YR 5/8) cherty silty clay loam; many medium prominent light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm, compact, and brittle in about 40 percent of the mass; 25 percent by volume fragments of chert 1/2 inch to 1 inch across; strongly acid; clear wavy boundary.
B24t—51 to 67 inches; yellowish red (5YR 5/8) cherty silty clay loam; common medium distinct yellowish brown (10YR 5/8) and brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm; 20 percent by volume fragments of chert 1/4 inch to 1/2 inch across; strongly acid.

The thickness of the solum ranges from 60 to 80 inches, and the depth to bedrock is more than 8 feet. The content of chert ranges from 15 to 35 percent by volume in each horizon. Reaction is strongly acid or very strongly acid in each horizon. The depth to the horizon that has fragic properties ranges from 25 to 40 inches.

The A1 horizon has hue of 10YR or 2.5Y, value of 3 to 5, and chroma of 1 to 3. The A2 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 6. The fine earth fraction of the A horizon is silt loam or loam.

The B1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. The fine earth fraction is silt loam, silty clay loam, or clay loam.

The B2t horizon has hue of 10YR, 7.5YR, or 2.5Y, value of 5 or 6, and chroma of 4 to 8. It is mottled in shades of brown, gray, yellow, and red except in the B21t horizon, which has no mottles. Some subhorizons are mottled without a dominant color. The fine earth fraction is silty clay loam or clay loam except in the lower part, which is clay in some pedons.

Staser series

The Staser series consists of deep, well drained, nearly level soils that formed in alluvium on flood plains. Slopes range from 0 to 3 percent.

Staser soils are on the same landscape as Hamblen and Sequatchie soils. Hamblen soils differ from Staser soils mainly by being moderately well drained. Sequatchie soils are on terraces and have an argillic horizon.

Typical pedon of Staser loam, 500 feet south of Moccasin Bend Psychiatric Hospital, on the west side of the Tennessee River near Interstate Highway 24:

Ap—0 to 10 inches; very dark grayish brown (10YR 3/2) loam; moderate medium granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

A12—10 to 30 inches; dark brown (10YR 3/3) loam; moderate medium granular structure; very friable; many fine roots; slightly acid; clear smooth boundary.

B2—30 to 60 inches; dark yellowish brown (10YR 4/4) loam; moderate medium subangular blocky structure; very friable; few fine roots; slightly acid.

The thickness of the mollic epipedon ranges from 24 to 40 inches. It is slightly acid or mildly alkaline. The content of chert fragments and pebbles ranges from 0 to 10 percent in the upper 40 inches and from 0 to 30 percent below.

The A horizon has hue of 10YR or 7.5YR, value of 3, and chroma of 2 or 3. It is loam or fine sandy loam.

The B2 horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 3 or 4. Some pedons have mottles in shades of brown and gray in the lower part of the horizon. Texture is loam or fine sandy loam.

Talbott series

The Talbott series consists of moderately deep, well drained, gently sloping to moderately steep soils that formed in materials weathered from limestone. Slopes range from 2 to 25 percent.

Talbott soils are on the same landscape as Capshaw, Colbert, and Collegedale soils. Capshaw soils differ from Talbott soils mainly by being moderately well drained and having a solum more than 40 inches thick. Colbert soils are moderately well drained, have more than 60 percent clay in the particle-size control section, and have montmorillonitic mineralogy. Collegedale soils have a solum more than 60 inches thick and low base saturation.

Typical pedon of Talbott silt loam, 2 to 12 percent slopes, 1 1/4 miles on Morris Hill Road from the intersection of East Brainerd Road and Morris Hill Road, 50 feet on left:

Ap—0 to 6 inches; yellowish brown (10YR 5/4) silt loam; moderate fine granular structure; friable; many fine roots; medium acid; clear smooth boundary.

B21t—6 to 10 inches; yellowish red (5YR 4/6) clay; few medium distinct brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; many fine roots; thick discontinuous clay films; strongly acid; gradual smooth boundary.

B22t—10 to 24 inches; yellowish red (5YR 5/8) clay; common fine and medium distinct yellowish brown (10YR 5/4) mottles; moderate medium angular blocky structure; firm, plastic; few fine roots; thick continuous clay films; strongly acid; gradual smooth boundary.

B23t—24 to 36 inches; yellowish brown (10YR 5/6) clay, common fine and medium distinct yellowish red (5YR 4/6) mottles; strong medium and coarse angular blocky structure; very firm, plastic; thick continuous clay films; medium acid; gradual smooth boundary.

R—36 inches; limestone bedrock.

The depth to bedrock and the thickness of the solum range from 20 to 40 inches. Reaction is medium acid or strongly acid, except in the layer near bedrock and in areas where the surface layer has been limed, which are less acid. The content of rock fragments ranges from 0 to 10 percent by volume in each horizon.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 to 6. Texture is silt loam except in severely eroded areas, where it is silty clay loam or clay.

The B2t horizon has dominant hue of 5YR, but in some pedons it has hue of 7.5YR or 2.5YR and ranges to 10YR in the lower part. The B2t horizon has value of 4 or 5 and chroma of 4 to 8. Mottles are few to many in shades of yellow, brown, or red. Texture is clay or silty clay.

The B3 horizon, where present, has hue of 10YR, 7.5YR, or 5YR, value of 4 or 5, and chroma of 6 or 8. Few to many mottles in shades of brown, red, and gray are in the B3 horizon. Texture is silty clay or clay.

Tupelo series

The Tupelo series consists of deep, somewhat poorly drained, nearly level and gently sloping soils that developed in clayey alluvium or in a thin layer of alluvium and the underlying clayey residuum. These soils are on stream terraces, foot slopes of ridges, and in depressions on uplands. Slopes range from 0 to 3 percent.

Tupelo soils are on the same landscape as Colbert and Capshaw soils. Colbert soils are on slightly higher elevations than Tupelo soils, are moderately well drained, and have more than 60 percent clay in the upper 20 inches of the argillic horizon. Capshaw soils are moderately well drained and do not have mottles of chroma of 2 or less in the upper 10 inches of the argillic horizon.

Typical pedon of Tupelo silt loam in an area off East Brainerd Road, 500 feet from Mackey Creek and 100 feet north of private road:

Ap—0 to 8 inches; yellowish brown (10YR 5/4) silt loam; few fine faint light olive brown (2.5Y 5/4) mottles; weak fine granular structure; friable; common fine roots; slightly acid; clear smooth boundary.

B1—8 to 16 inches; yellowish brown (10YR 5/6) silt loam; few fine faint light olive brown (2.5Y 5/4) mottles; moderate medium subangular blocky structure; friable; few fine roots; slightly acid; clear wavy boundary.

B21t—16 to 26 inches; light olive brown (2.5Y 5/4) silty clay; many coarse faint yellowish brown (10YR 5/6) and common fine distinct light brownish gray (2.5Y 6/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; thin continuous clay films; gradual wavy boundary.

B22t—26 to 32 inches; pale olive (5Y 6/3) clay; many medium distinct light brownish gray (2.5Y 6/2) and dark brown (7.5YR 4/4) mottles; moderate medium angular blocky structure; firm; thick continuous clay films; medium acid; gradual smooth boundary.

B23t—32 to 48 inches; light brownish gray (2.5Y 6/2) clay; many fine and medium distinct yellowish brown (10YR 5/6) and brown (7.5YR 5/4) mottles; moderate medium angular blocky structure; firm; thick continuous clay films; medium acid; gradual smooth boundary.

Cg—48 to 60 inches; gray (N 6/) clay; many medium distinct strong brown (7.5YR 5/6) mottles; massive; very firm; slightly acid.

The thickness of the solum ranges from 35 to 60 inches. The depth to limestone bedrock ranges from 40 to 70 inches or more. Reaction is slightly acid to strongly acid except in horizons immediately above the limestone bedrock where it ranges to mildly alkaline.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam or silty clay loam.

The B1 horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 3 to 8. Texture is silt loam or silty clay loam. The B21t and B22t horizons have hue of 5Y to 10YR, value of 5 or 6, and chroma of 3 to 8 and are mottled in shades of gray, brown, and olive. Texture is clay or silty clay. The B23t horizon has colors and textures that are similar to those of the B22t. In some pedons it is dominantly gray.

The Cg horizon and B3g horizon, where present, are dominantly gray mottled in shades of brown, olive, and yellow.

Waynesboro series

The Waynesboro series consists of deep, well drained, gently sloping to moderately steep soils that formed in thick deposits of old alluvium on high stream terraces. The alluvium ranges from 4 to 10 feet in thickness and is underlain by residuum of limestone or shale. Slopes range from 2 to 25 percent.

Waynesboro soils are on the same landscape as Dewey and Etowah soils. Dewey soils differ from Waynesboro soils mainly by having a clayey B horizon that contains less than 20 percent sand and has fragments of chert in the lower part. Etowah soils have dark reddish brown A and B horizons that contain less than 35 percent clay.

Typical pedon of Waynesboro loam, 2 to 8 percent slopes; take Highway 58 to intersection of Grasshopper Road, left on Grasshopper Road 300 feet, then 250 feet on left in field:

Ap—0 to 3 inches; brown (7.5YR 4/4) loam; weak fine granular structure; friable; common fine and medium roots; medium acid; abrupt smooth boundary.

B1—3 to 9 inches; yellowish red (5YR 5/8) loam; weak fine subangular blocky structure; friable; common fine roots; strongly acid; gradual smooth boundary.

B21t—9 to 19 inches; red (2.5YR 5/8) clay loam; weak fine subangular blocky structure; friable; few fine roots; thin patchy clay films; strongly acid; gradual smooth boundary.

B22t—19 to 35 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; friable; few fine roots; thin continuous clay films; strongly acid; gradual smooth boundary.

B23t—35 to 60 inches; red (2.5YR 4/6) clay; few fine distinct strong brown (7.5YR 5/8) mottles; friable; thin continuous clay films; strongly acid.

The depth to bedrock and the thickness of the solum are greater than 60 inches. Reaction is strongly acid,

except in areas where the surface layer has been limed. Each horizon contains from 0 to 15 percent by volume pebbles, cobblestones, or sandstone fragments.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is loam or silt loam. Where it is severely eroded, the Ap horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 6. Texture is clay loam or sandy clay loam.

The B1 horizon has hue of 7.5YR, 5YR, or 2.5YR, value of 4 or 5, and chroma of 6 to 8. The B2t horizon has hue of 5YR or 2.5YR, value of 3 to 5, and chroma of 6 to 8. In some pedons, the lower part of the B2t has few to common mottles in shades of brown, yellow, and red. Texture is clay loam, sandy clay, or clay.

Welchland series

The Welchland series consists of deep, well drained, gently sloping cobbly soils on alluvial fans and stream terraces. These soils formed in local alluvium near the base of the Cumberland Mountain. Slopes range from 2 to 7 percent.

Welchland soils are on the same landscape as Sequatchie and Whitwell soils. The Sequatchie soils are deep, well drained, and differ from the Welchland soils mainly by containing less than 15 percent by volume coarse fragments. The Whitwell soils are moderately well drained and contain less than 15 percent by volume coarse fragments.

Typical pedon of Welchland cobbly loam, 2 to 7 percent slopes, 1/2 mile north of Bakewell at the intersection of Mountain Road and Back Valley Road, 100 feet north of intersection:

Ap—0 to 6 inches; dark yellowish brown (10YR 3/4) cobbly loam; weak fine granular structure; very friable; many fine roots; 20 percent by volume rounded rock fragments 1 inch to 5 inches across; strongly acid; clear smooth boundary.

B1—6 to 18 inches; strong brown (7.5YR 5/8) cobbly loam; weak fine subangular blocky structure; very friable; common fine roots; 20 percent by volume rounded rock fragments 1 inch to 5 inches across; strongly acid; gradual wavy boundary.

B2t—18 to 36 inches; strong brown (7.5YR 5/8) cobbly sandy clay loam; weak fine subangular blocky structure; very friable; common fine roots; 35 percent by volume rounded fragments of sandstone 1 inch to 5 inches across; strongly acid; gradual wavy boundary.

B3—36 to 49 inches; yellowish brown (10YR 5/6) cobbly loam; weak fine subangular blocky structure; very friable; 40 percent by volume rounded fragments of sandstone 1 inch to 5 inches across; strongly acid; gradual wavy boundary.

C—49 to 65 inches; yellowish brown (10YR 5/4) cobbly sandy loam; massive; loose; very friable; 50 percent by volume rounded fragments of sandstone 1 inch to 5 inches across; strongly acid.

The thickness of the solum ranges from 36 to 60 inches. The depth to bedrock is more than 60 inches. Reaction is strongly acid, except in areas where the surface layer has been limed. The content of cobblestones and pebbles ranges from 15 to 45 percent in the A1, B1, and B2t horizons but averages less than 35 percent in the particle-size control section. The content of rock fragments ranges from 20 to 60 percent in the B3 and C horizons.

The Ap horizon has hue of 10YR, value of 3, and chroma of 3 or 4. The fine earth fraction is loam or sandy loam.

The B1 and B2t horizons have hue of 7.5YR, value of 4 or 5, and chroma of 4 to 8. The fine earth fraction is loam, sandy loam, or sandy clay loam.

The B3 and C horizons have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 6. The fine earth fraction is loam or sandy loam.

Whitwell series

The Whitwell series consists of deep, moderately well drained, nearly level and gently sloping soils that formed in alluvium on stream terraces. Slopes range from 1 to 3 percent.

Whitwell soils are on the same landscape as the well drained Humphreys and Sequatchie soils. Unlike the Whitwell soils, the Humphreys soils have a dark brown cherty surface layer and a brown cherty subsoil. The Sequatchie soils have a dark brown loamy surface layer and a brown subsoil that has no mottles in the upper part.

Typical pedon of Whitwell loam, 1/4 mile east of Daisy on road 500 feet behind food store:

Ap—0 to 6 inches; brown (10YR 5/3) loam; weak medium granular structure; friable; common fine and medium roots; medium acid; clear smooth boundary.

B1—6 to 13 inches; yellowish brown (10YR 5/4) loam; weak fine subangular blocky structure; friable; common fine and medium roots; strongly acid; clear smooth boundary.

B21t—13 to 24 inches; strong brown (7.5YR 5/6) clay loam; few fine distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; few fine roots; thin discontinuous clay films; strongly acid; gradual smooth boundary.

B22t—24 to 40 inches; strong brown (7.5YR 5/6) clay loam; many fine distinct pale brown (10YR 6/3), light brownish gray (2.5Y 6/2), and gray (10YR 6/1) mottles; moderate fine subangular blocky structure; friable; few fine roots; thin discontinuous clay films; few small black concretions; strongly acid; gradual smooth boundary.

B3—40 to 48 inches; yellowish brown (10YR 5/4) loam; many fine distinct light brownish gray (10YR 6/2) mottles; weak fine subangular blocky structure; friable; strongly acid; clear smooth boundary.
C—48 to 64 inches; yellowish brown (10YR 5/4) loam; many medium distinct gray (10YR 6/1) mottles; massive; friable; strongly acid.

The thickness of the solum ranges from 30 to 60 inches. The depth to bedrock is greater than 60 inches. Reaction is strongly acid, except in areas where the surface layer has been limed.

The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. Texture is loam or silt loam.

The B horizon has hue of 10YR or 7.5YR, value or 4 or 5, and chroma of 3 to 6. Mottles of chroma of 2 less begin about 10 inches below the upper boundary of the B horizon. Texture is clay loam, loam, silt loam, or silty clay loam.

The C horizon is mottled in shades of brown and gray. In some pedons it is dominantly brown, and in others it is gray. Texture is loam, silt loam, or clay loam, and in some pedons the horizon is stratified.

Woodmont series

The Woodmont series consists of deep, somewhat poorly drained, nearly level soils which have a fragipan that formed in alluvium from limestone and shale. These soils are on upland flats and stream terraces. Slopes range from 0 to 2 percent.

Woodmont soils are on the same landscape as Nesbitt, Guthrie, and Tupelo soils. The Nesbitt soils are deep and differ from the Woodmont soils mainly by being moderately well drained. The Guthrie soils are poorly drained, and the Tupelo soils are somewhat poorly drained and have a clayey subsoil.

Typical pedon of Woodmont silt loam, in an area off Hixon Pike on Armstrong Road, 0.9 mile past Rivergate Bay Subdivision, 100 feet from road on right:

Ap—0 to 5 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; many fine roots; strongly acid; clear smooth boundary.
B1—5 to 11 inches; yellowish brown (10YR 5/4) silt loam; few fine faint light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; many fine roots; strongly acid; clear smooth boundary.
B2—11 to 20 inches; light yellowish brown (2.5Y 6/4) silt loam; common fine faint grayish brown (2.5Y 5/2) and light olive brown (2.5Y 5/4) mottles; weak medium subangular blocky structure; friable; common fine roots; strongly acid; gradual smooth boundary.
A'2&B'x1—20 to 24 inches; light brownish gray (2.5Y 6/2) silt loam; the B part is light yellowish brown (2.5Y 6/4) silt loam and is brittle; weak fine granular subangular blocky structure; friable; few fine roots.
B'x2—24 to 40 inches; mottled light yellowish brown (2.5Y 6/4), gray (10YR 6/1), and yellowish brown (10YR 5/6) silt loam, moderate coarse prismatic structure parting to moderate medium angular blocky; vertical seams of gray silt 1/2 to 1 inch wide between prisms; firm, brittle in about 70 percent of mass; clay films on faces of prisms and some secondary peds; strongly acid; gradual wavy boundary.
B'x3—40 to 60 inches; mottled gray (10YR 6/1), light yellowish brown (2.5Y 6/4), and yellowish brown (10YR 5/6) silt loam; moderate coarse prismatic structure parting to weak medium subangular blocky; vertical seams of gray silt loam 1/2 to 3/4 inch wide between prisms; firm, brittle in about 70 percent of mass; thick clay films on faces of prisms; 5 percent by volume fragments of chert less than 1 inch across; strongly acid.

The thickness of the solum is more than 60 inches. The depth to the fragipan ranges from 20 to 36 inches. Reaction is strongly acid, except in the lower part of the solum where it ranges from slightly acid to strongly acid. The content of coarse fragments ranges from 0 to 3 percent above the fragipan and from 0 to about 10 percent in the fragipan.

The A horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 or 3.

The B1 and B2 horizons have hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. Mottles are few to many in shades of gray and brown. Texture is silt loam or light silty clay loam.

The A'2 horizon has hue of 10YR or 2.5Y, value of 6 or 7, and chroma of 1 or 2. Texture is silt loam or silt.

The Bx horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 6. Mottles are common to many in shades of brown or gray. Many pedons are mottled in shades of brown and gray without a dominant color. Texture is silt loam or light silty clay loam. In some pedons, the Bx horizon is underlain by clayey residuum of limestone below 48 inches.

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glossary

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2
Low	2 to 4
Moderate	4 to 6
High	More than 6

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a fragment.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of

regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutover (woodland). Woodland in which most or all of the merchantable timber has been cut.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Hard to pack (in tables). Difficult to compact.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow

represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Roman numeral II precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Large stones (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Open space. A relatively undeveloped green or wooded area provided mainly within an urban area to minimize feelings of congested living.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability

is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.20 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-75 at Chattanooga, Tenn.]

Month	Temperature[1]						Precipitation[1]				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days[1]	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January	49.4	30.0	39.7	73	5	31	5.30	3.28	7.12	9	1.8
February	53.0	31.7	42.4	74	9	48	5.16	2.97	6.94	8	1.3
March	60.6	38.3	49.5	82	19	121	5.99	3.24	8.23	9	.7
April	72.5	47.4	60.0	89	29	306	4.40	2.47	5.96	7	.0
May	80.2	55.5	67.9	93	37	555	3.76	2.25	5.10	7	.0
June	86.5	63.7	75.2	97	48	756	3.32	1.78	4.57	7	.0
July	89.1	67.8	78.5	99	56	884	4.64	2.13	6.69	8	.0
August	88.6	67.1	77.9	98	56	965	3.51	1.99	4.75	7	.0
September	83.1	61.0	72.1	97	43	663	3.89	1.76	5.62	6	.0
October	72.8	48.0	60.4	88	28	332	2.94	1.27	4.28	5	.0
November	60.3	37.0	48.7	79	19	58	3.97	2.39	5.38	7	.0
December	51.3	31.8	41.6	73	10	33	5.45	3.07	7.39	8	.8
Year	70.6	48.3	59.5	100	3	4,652	52.33	45.16	59.23	88	4.6

[1]A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-75 at Chattanooga, Tenn.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 28	April 11	April 19
2 years in 10 later than--	March 20	April 5	April 15
5 years in 10 later than--	March 6	March 24	April 7
First freezing temperature in fall:			
1 year in 10 earlier than--	November 3	October 25	October 21
2 years in 10 earlier than--	November 9	October 29	October 24
5 years in 10 earlier than--	November 20	November 7	October 30

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-75 at Chattanooga, Tenn.]

Probability	Daily minimum temperature during growing season		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	231	208	192
8 years in 10	240	214	196
5 years in 10	259	227	205
2 years in 10	277	240	213
1 year in 10	287	246	218

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
AeC	Allen loam, 3 to 12 percent slopes	3,011	0.9
AeD	Allen loam, 12 to 25 percent slopes	3,601	1.0
AeE	Allen loam, 25 to 40 percent slopes	1,844	0.5
ApC	Apison loam, 5 to 15 percent slopes	2,040	0.6
ArB	Arents, gently sloping	5,412	1.5
AuD	Armuchee silt loam, 10 to 25 percent slopes	5,681	1.6
AuE	Armuchee silt loam, 25 to 40 percent slopes	2,737	0.8
BaE	Barfield-Rock outcrop complex, 10 to 40 percent slopes	2,170	0.6
BoC	Bodine cherty silt loam, 5 to 12 percent slopes	14,398	4.1
BoD	Bodine cherty silt loam, 12 to 25 percent slopes	2,600	0.7
BoE	Bodine cherty silt loam, 25 to 45 percent slopes	16,742	4.8
BsD	Bodine-Shack complex, 5 to 25 percent slopes	2,972	0.8
BuF	Bouldin-Gilpin complex, 20 to 60 percent slopes	22,916	6.5
CaB	Capshaw silt loam, 2 to 6 percent slopes	5,229	1.5
CbC	Colbert silt loam, 2 to 12 percent slopes	8,571	2.4
CcD	Colbert-Rock outcrop complex, 5 to 20 percent slopes	2,135	0.6
CdC	Colbert-Urban land complex, 2 to 12 percent slopes	11,774	3.3
CoC	Collegedale silt loam, 2 to 12 percent slopes	1,521	0.4
CoD	Collegedale silt loam, 12 to 25 percent slopes	622	0.2
CrB	Crossville loam, 2 to 5 percent slopes	1,792	0.5
DeB	Dewey silt loam, 2 to 6 percent slopes	4,869	1.4
DeD	Dewey silt loam, 12 to 25 percent slopes	3,416	1.0
Du	Dunning silty clay loam	209	0.1
Ec	Emory silt loam	526	0.1
EdC	Enders silt loam, 2 to 12 percent slopes	5,714	1.6
EeD	Enders silty clay loam, 12 to 25 percent slopes, eroded	1,884	0.5
EgC	Enders gravelly loam, 2 to 12 percent slopes	1,489	0.4
EhC	Enders-Urban land complex, 2 to 12 percent slopes	1,590	0.5
En	Ennis cherty silt loam	1,554	0.4
EtB	Etowah silt loam, 2 to 5 percent slopes	8,405	2.4
EtD	Etowah silt loam, 12 to 20 percent slopes	695	0.2
FuB	Fullerton cherty silt loam, 3 to 7 percent slopes	18,633	5.3
FuD	Fullerton cherty silt loam, 12 to 25 percent slopes	19,269	5.5
FuE	Fullerton cherty silt loam, 25 to 40 percent slopes	16,701	4.7
FwD	Fullerton-Urban land complex, 3 to 40 percent slopes	22,990	6.6
GpD	Gilpin silt loam, 12 to 25 percent slopes	3,621	1.0
GpE	Gilpin silt loam, 25 to 40 percent slopes	4,700	1.3
Gu	Guthrie silt loam	646	0.2
Ha	Hamblen silt loam	3,823	1.1
HcD	Hanceville loam, 12 to 25 percent slopes	153	*
HcE	Hanceville loam, 25 to 40 percent slopes	940	0.3
HoB	Holston loam, 2 to 6 percent slopes	2,060	0.6
HoD	Holston loam, 10 to 20 percent slopes	418	0.1
HuB	Humphreys cherty silt loam, 1 to 6 percent slopes	695	0.2
LiB	Lily loam, 2 to 7 percent slopes	17,874	5.2
LiD	Lily loam, 12 to 20 percent slopes	5,256	1.5
LnB	Lonewood silt loam, 2 to 6 percent slopes	4,757	1.4
Lo	Lobelville cherty silt loam	475	0.1
MnB	Minvale cherty silt loam, 3 to 12 percent slopes	4,474	1.3
MnD	Minvale cherty silt loam, 12 to 20 percent slopes	2,375	0.7
MoE	Montevallo shaly silt loam, 20 to 45 percent slopes	4,298	1.2
Ne	Newark silt loam	1,780	0.5
NsB	Nesbitt silt loam, 2 to 6 percent slopes	1,383	0.4
Pt	Pits, quarries	197	0.1
RaD	Ramsey loam, 8 to 25 percent slopes	5,504	1.6
RcF	Ramsey-Rock outcrop complex, 15 to 70 percent slopes	11,120	3.2
RoA	Roane cherty loam, 0 to 2 percent slopes	1,719	0.5
RoB	Roane cherty silt loam, 2 to 6 percent slopes	7,325	2.1
SeB	Sequatchie loam, 2 to 7 percent slopes	5,054	1.4
SfB	Sequatchie-Urban land complex, 2 to 7 percent slopes	3,690	1.0
SmD	Sequoia silt loam, 8 to 20 percent slopes	421	0.1
Sn	Sewanee Variant silt loam	440	0.1
St	Staser loam	2,875	0.8
TaC	Talbott silt loam, 2 to 12 percent slopes	4,114	1.2
TaD	Talbott silt loam, 12 to 25 percent slopes	782	0.2
TrD	Talbott-Rock outcrop complex, 5 to 25 percent slopes	2,744	0.8
Tu	Tupelo silt loam	5,034	1.4
UPF	Udorthents and Pits, steep	1,286	0.4
Ur	Urban land	3,061	0.9
WaB	Waynesboro loam, 2 to 8 percent slopes	3,548	1.0

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
WaD	Waynesboro loam, 12 to 25 percent slopes	2,044	0.6
WeB	Welchland cobbly loam, 2 to 7 percent slopes	1,443	0.4
Wh	Whitwell loam	3,666	1.0
Wo	Woodmont silt loam	493	0.1
	Total	352,000	100.0

* Less than 0.1 percent.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Soil name and map symbol	Corn	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Bu	Bu	Ton	Ton	AUM*
AeC---- Allen	80	30	50	3.5	2.5	6.5
AeD---- Allen	70	---	---	3.0	2.0	6.0
AeE---- Allen	---	---	---	---	---	3.5**
ApC---- Apison	75	30	50	---	2.5	6.5
ArB. Arents						
AuD---- Armuchee	---	---	---	---	1.5	4.5
AuE---- Armuchee	---	---	---	---	---	2.5**
BaE---- Barfield-Rock outcrop	---	---	---	---	---	2.5**
BoC---- Bodine	---	---	---	---	1.5	4.0
BoD---- Bodine	---	---	---	---	1.0	3.5
BoE---- Bodine	---	---	---	---	---	2.0**
BsD---- Bodine-Shack	---	---	---	---	1.5	4.0
BuF---- Bouldin-Gilpin	---	---	---	---	---	---
CaB---- Capshaw	65	25	45	---	2.0	5.5
CbC---- Colbert	---	---	30	---	1.5	4.5
CcD---- Colbert-Rock outcrop	---	---	---	---	---	---
CdC---- Colbert-Urban land	---	---	---	---	---	---
CoC---- Collegedale	65	25	45	2.5	2.0	5.5
CoD---- Collegedale	---	---	---	---	2.0	5.0
CrB---- Crossville	80	30	50	---	2.5	6.5
DeB---- Dewey	80	30	50	3.5	2.5	6.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Bu	Bu	Ton	Ton	AUM*
DeD---- Dewey	70	---	---	3.0	2.5	6.0
Du---- Dunning	80	35	---	---	2.5	7.0
Ec---- Emory	120	45	55	4.0	3.0	7.5
EdC---- Enders	60	---	30	---	2.0	5.0
EeD---- Enders	---	---	---	---	1.5	4.5
EgC---- Enders	65	25	35	---	2.0	5.5
EhC---- Enders-Urban land	---	---	---	---	---	---
En---- Ennis	75	30	45	---	2.5	6.5
EtB---- Etowah	95	40	50	3.5	3.0	7.0
EtD---- Etowah	80	30	45	3.0	2.5	6.5
FuB---- Fullerton	65	---	40	3.0	2.5	6.0
FuD---- Fullerton	---	---	---	2.5	2.0	5.5
FuE---- Fullerton	---	---	---	---	---	3.0**
FwD---- Fullerton-Urban land	---	---	---	---	---	---
GpD---- Gilpin	70	---	---	---	2.0	5.5
GpE---- Gilpin	---	---	---	---	---	3.0**
Gu---- Guthrie	---	25	---	---	2.0	5.0
Ha---- Hamblen	110	40	---	---	3.0	7.5
HcD---- Hanceville	---	---	---	---	2.0	5.5
HcE---- Hanceville	---	---	---	---	---	---
HoB---- Holston	90	35	45	3.0	2.5	6.5
HoD---- Holston	75	25	40	3.0	2.5	6.0
HuB---- Humphreys	80	30	45	3.0	2.5	6.5

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Bu	Bu	Ton	Ton	AUM*
LiB---- Lily	85	35	40	---	2.5	6.5
LiD---- Lily	75	30	35	---	2.0	6.0
LnB---- Lonewood	95	40	50	3.5	2.5	7.0
Lo---- Lobelville	75	30	30	---	2.5	6.5
MnB---- Minvale	75	30	40	3.0	2.5	6.5
MnD---- Minvale	65	25	35	2.5	2.0	6.0
MoE---- Montevallo	---	---	---	---	---	2.0**
Ne---- Newark	100	40	---	---	2.5	7.0
NsB---- Nesbitt	85	35	45	3.0	2.5	7.0
Pt. Pits						
RaD---- Ramsey	---	---	---	---	1.0	3.5
RcF---- Ramsey-Rock outcrop	---	---	---	---	---	---
RoA---- Roane	---	---	---	---	2.0	6.0
RoB---- Roane	70	30	40	---	2.0	6.0
SeB---- Sequatchie	115	45	55	3.5	2.5	7.0
SfB---- Sequatchie-Urban land	---	---	---	---	---	---
SmD---- Sequoia	55	---	30	---	2.0	5.0
Sn---- Sewanee Variant	75	30	---	---	2.5	6.5
St---- Staser	120	45	50	3.5	3.0	7.5
TaC---- Talbott	60	20	35	---	2.0	5.0
TaD---- Talbott	---	---	---	---	1.5	4.5
TrD---- Talbott-Rock outcrop	---	---	---	---	---	2.5**
Tu---- Tupelo	65	35	---	---	2.0	6.0

See footnotes at end of table.

TABLE 5.--YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Soil name and map symbol	Corn	Soybeans	Wheat	Alfalfa hay	Grass-legume hay	Pasture
	Bu	Bu	Bu	Ton	Ton	AUM*
UPF---------- Udorthents and Pits	---	---	---	---	---	---
Ur. Urban land						
WaB---------- Waynesboro	90	35	50	3.5	2.5	6.5
WaD---------- Waynesboro	75	---	---	3.0	2.0	6.0
WeB---------- Welchland	70	30	40	2.5	2.0	5.5
Wh---------- Whitwell	85	35	35	---	2.5	7.0
Wo---------- Woodmont	60	30	---	---	2.5	6.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** Pasture that cannot be managed with normal farm equipment because of steep slopes or rock outcrop. Includes native plants and introduced species such as tall fescue.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
AeC, AeD---------- Allen	3o	Slight	Slight	Slight	Slight	Yellow-poplar-------	87	Yellow-poplar, shortleaf pine.
						Shortleaf pine------	72	
AeE---------- Allen	3r	Moderate	Moderate	Slight	Slight	Virginia pine-------	73	Loblolly pine, black walnut.
						Southern red oak----	71	
ApC---------- Apison	3o	Slight	Slight	Slight	Slight	Yellow-poplar-------	90	Shortleaf pine, loblolly pine.
						Northern red oak----	70	
						Shortleaf pine------	70	
						Loblolly pine-------	80	
						Virginia pine-------	70	
AuD---------- Armuchee	4d	Slight	Slight	Moderate	Slight	Shortleaf pine------	60	Virginia pine, loblolly pine.
						Virginia pine-------	60	
						Loblolly pine-------	70	
						White oak-----------	60	
						Southern red oak----	60	
AuE---------- Armuchee	4d	Moderate	Moderate	Moderate	Slight	Shortleaf pine------	60	Virginia pine, loblolly pine.
						Virginia pine-------	60	
						Loblolly pine-------	70	
						White oak-----------	60	
						Southern red oak----	60	
BaE*:								
Barfield----------	4d	Moderate	Moderate	Severe	Moderate	Eastern redcedar----	40	Eastern redcedar.
Rock outcrop.								
BoC, BoD---------- Bodine	4f	Slight	Slight	Moderate	Slight	Virginia pine-------	50	Virginia pine, eastern redcedar.
						Chestnut oak--------	55	
						Scarlet oak---------	55	
BoE---------- Bodine	4f	Moderate	Moderate	Severe	Slight	Virginia pine-------	50	Virginia pine, eastern redcedar.
						Chestnut oak--------	55	
						Scarlet oak---------	55	
BsD*:								
Bodine----------	4f	Slight	Slight	Moderate	Slight	Virginia pine-------	50	Virginia pine, eastern redcedar.
						Chestnut oak--------	55	
						Scarlet oak---------	55	
Shack----------	3r	Moderate	Slight	Slight	Slight	Yellow-poplar-------	89	Yellow-poplar, shortleaf pine, loblolly pine.
						Loblolly pine-------	80	
						Shortleaf pine------	73	
BuF*:								
Bouldin----------	3x	Moderate	Severe	Slight	Slight	Yellow-poplar-------	90	Yellow-poplar, shortleaf pine.
						Northern red oak----	75	
						Shortleaf pine------	70	
						White oak-----------	70	
Gilpin----------	3r	Severe	Severe	Slight	Slight	Northern red oak----	70	Virginia pine, shortleaf pine, eastern white pine, black cherry, yellow-poplar.
						Yellow-poplar-------	90	
CaB---------- Capshaw	3o	Slight	Slight	Slight	Slight	Loblolly pine-------	80	Loblolly pine, shortleaf pine.
						Yellow-poplar-------	90	
						Northern red oak----	70	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
CbC---------- Colbert	4c	Slight	Moderate	Moderate	Slight	Loblolly pine-------	65	Loblolly pine,
						Shortleaf pine------	60	shortleaf pine,
						Eastern redcedar----	47	eastern redcedar.
CcD*:								
Colbert----------	4c	Slight	Moderate	Moderate	Slight	Loblolly pine-------	65	Loblolly pine,
						Shortleaf pine------	60	shortleaf pine,
						Eastern redcedar----	47	eastern redcedar.
Rock outcrop.								
CdC*:								
Colbert----------	4c	Slight	Moderate	Moderate	Slight	Loblolly pine-------	65	Loblolly pine,
						Shortleaf pine------	60	shortleaf pine,
						Eastern redcedar----	47	eastern redcedar.
Urban land.								
CoC, CoD---------- Collegedale	3o	Slight	Slight	Slight	Slight	Yellow-poplar-------	90	Yellow-poplar,
						Southern red oak----	70	loblolly pine,
						White oak----------	70	shortleaf pine.
						Shortleaf pine------	70	
						Virginia pine-------	70	
						Loblolly pine-------	80	
CrB---------- Crossville	4o	Slight	Slight	Slight	Slight	Shortleaf pine------	60	Shortleaf pine,
						Virginia pine-------	60	Virginia pine,
						Loblolly pine-------	70	loblolly pine,
						Eastern white pine--	70	eastern white pine.
DeB, DeD---------- Dewey	3o	Slight	Slight	Slight	Slight	Yellow-poplar-------	90	Yellow-poplar, black
						White oak----------	70	walnut, loblolly
						Southern red oak----	70	pine, eastern white
						Shortleaf pine------	73	pine.
						Virginia pine-------	70	
						Loblolly pine-------	78	
Du---------- Dunning	1w	Slight	Severe	Severe	Slight	Pin oak------------	95	Loblolly pine, pin
						Sweetgum-----------	95	oak.
						Eastern cottonwood--	100	
Ec---------- Emory	2o	Slight	Slight	Slight	Slight	Yellow-poplar-------	104	Yellow-poplar, black
						Northern red oak----	80	walnut, loblolly
						Loblolly pine-------	90	pine.
						Black walnut--------	---	
						White ash----------	---	
						Black cherry--------	---	
EdC, EeD, EgC------ Enders	4o	Slight	Slight	Slight	Slight	Southern red oak----	60	Loblolly pine,
						White oak----------	55	shortleaf pine.
EhC*:								
Enders----------	4o	Slight	Slight	Slight	Slight	Southern red oak----	60	Loblolly pine,
						White oak----------	55	shortleaf pine.
Urban land.								
En---------- Ennis	2o	Slight	Slight	Slight	Slight	Yellow-poplar-------	100	Yellow-poplar, black
						White oak----------	80	walnut, loblolly
						Loblolly pine-------	90	pine.
						Black walnut--------	---	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
EtB, EtD---------- Etowah	2o	Slight	Slight	Slight	Slight	Yellow-poplar------- Southern red oak---- Loblolly pine------- Shortleaf pine------ Black walnut--------	90 80 90 80 ---	Yellow-poplar, black walnut.
FuB, FuD---------- Fullerton	3o	Slight	Slight	Slight	Slight	Yellow-poplar------- White oak---------- Southern red oak---- Loblolly pine------- Shortleaf pine------ Virginia pine------- Eastern redcedar----	90 70 70 74 67 68 50	Shortleaf pine, loblolly pine, Virginia pine, eastern white pine.
FuE---------- Fullerton	3r	Moderate	Moderate	Slight	Slight	Yellow-poplar------- White oak---------- Southern red oak---- Loblolly pine------- Shortleaf pine------ Virginia pine------- Eastern redcedar----	90 70 70 74 67 68 50	Shortleaf pine, loblolly pine, Virginia pine, eastern white pine.
FwD*: Fullerton--------- Urban land.	3r	Moderate	Moderate	Slight	Slight	Yellow-poplar------- White oak---------- Southern red oak---- Loblolly pine------- Shortleaf pine------ Virginia pine------- Eastern redcedar----	90 70 70 74 67 68 50	Shortleaf pine, loblolly pine, Virginia pine, eastern white pine.
GpD, GpE---------- Gilpin	3r	Moderate	Moderate	Slight	Slight	Northern red oak---- Yellow-poplar-------	70 90	Virginia pine, shortleaf pine, eastern white pine, black cherry, yellow-poplar.
Gu---------- Guthrie	2w	Slight	Severe	Severe	Moderate	Yellow-poplar------- Southern red oak---- Loblolly pine------- Willow oak---------- Sweetgum----------	100 75 80 85 90	Loblolly pine, sweetgum.
Ha---------- Hamblen	2w	Slight	Moderate	Slight	Slight	Yellow-poplar------- Northern red oak---- Loblolly pine-------	100 80 90	Loblolly pine, yellow-poplar.
HcD---------- Hanceville	4o	Slight	Slight	Slight	Slight	Loblolly pine------- Shortleaf pine------ Virginia pine-------	73 65 70	Loblolly pine, Virginia pine.
HcE---------- Hanceville	4r	Moderate	Moderate	Slight	Slight	Loblolly pine------- Shortleaf pine------ Virginia pine-------	73 65 70	Loblolly pine, Virginia pine.
HoB, HoD---------- Holston	3o	Slight	Slight	Slight	Slight	Yellow-poplar------- Northern red oak---- Shortleaf pine------ Loblolly pine------- Virginia pine-------	86 78 69 85 73	Loblolly pine, shortleaf pine, Virginia pine.
HuB---------- Humphreys	2o	Slight	Slight	Slight	Slight	Yellow-poplar------- Northern red oak---- Shortleaf pine------ Loblolly pine------- Black walnut--------	100 70 70 90 ---	Yellow-poplar, black walnut, loblolly pine.

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
LiB---------- Lily	4o	Slight	Slight	Slight	Slight	Shortleaf pine------	63	Loblolly pine, shortleaf pine, Virginia pine, white oak.
						Virginia pine-------	65	
LiD---------- Lily	4r	Moderate	Moderate	Slight	Slight	Shortleaf pine------	63	Loblolly pine, shortleaf pine, Virginia pine, white oak.
						Virginia pine-------	65	
LnB---------- Lonewood	3o	Slight	Slight	Slight	Slight	White oak-----------	70	Loblolly pine, shortleaf pine, Virginia pine, eastern white pine.
						Shortleaf pine------	70	
						Virginia pine-------	70	
						Loblolly pine-------	80	
						Eastern white pine--	80	
Lo---------- Lobelville	2w	Slight	Moderate	Slight	Slight	Yellow-poplar-------	94	Yellow-poplar, black walnut, loblolly pine.
						Southern red oak----	76	
						Loblolly pine-------	90	
						Black walnut--------	---	
						White oak-----------	---	
MnB, MnD---------- Minvale	3o	Slight	Slight	Slight	Slight	Yellow-poplar-------	90	Yellow-poplar, black walnut, shortleaf pine, loblolly pine.
						Shortleaf pine------	70	
						Loblolly pine-------	80	
						Virginia pine-------	70	
						White oak-----------	60	
						Black walnut--------	---	
MoE---------- Montevallo	4d	Severe	Moderate	Moderate	Moderate	Loblolly pine-------	66	Loblolly pine, Virginia pine.
						Shortleaf pine------	61	
						Virginia pine-------	57	
Ne---------- Newark	2w	Slight	Moderate	Slight	Moderate	Pin oak-------------	99	Eastern cottonwood, sweetgum, post oak, loblolly pine, red maple, American sycamore, eastern white pine, yellow-poplar.
						Eastern cottonwood--	94	
						Northern red oak----	85	
						Yellow-poplar-------	95	
						Sweetgum------------	88	
NsB---------- Nesbitt	3o	Slight	Slight	Slight	Slight	Southern red oak----	70	Loblolly pine, black walnut, black locust.
						Loblolly pine-------	80	
						Shortleaf pine------	70	
RaD---------- Ramsey	4d	Slight	Slight	Severe	Severe	White oak-----------	61	Virginia pine, shortleaf pine, eastern white pine, loblolly pine.
						Shortleaf pine------	59	
						Virginia pine-------	66	
						Loblolly pine-------	73	
						Eastern white pine--	70	
RcF*: Ramsey----------	4x	Severe	Severe	Severe	Severe	White oak-----------	61	Virginia pine, shortleaf pine, eastern white pine, loblolly pine.
						Shortleaf pine------	59	
						Virginia pine-------	66	
						Loblolly pine-------	73	
						Eastern white pine--	70	
Rock outcrop.								
RoA, RoB---------- Roane	3o	Slight	Slight	Slight	Slight	Loblolly pine-------	80	Loblolly pine, shortleaf pine, Virginia pine.
						Shortleaf pine------	70	
						Virginia pine-------	70	
						Southern red oak----	70	
						Yellow-poplar-------	90	
SeB---------- Sequatchie	2o	Slight	Slight	Slight	Slight	Yellow-poplar-------	100	Yellow-poplar, black walnut.
						White oak-----------	80	
						Loblolly pine-------	90	

See footnote at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Common trees	Site index	
SfB*:								
Sequatchie	2o	Slight	Slight	Slight	Slight	Yellow-poplar	100	Yellow-poplar, black walnut.
						White oak	80	
						Loblolly pine	90	
Urban land.								
SmD	3o	Slight	Slight	Slight	Slight	Northern red oak	70	Loblolly pine, shortleaf pine, Virginia pine.
Sequoia						Loblolly pine	83	
						Shortleaf pine	63	
						Virginia pine	71	
Sn	3w	Slight	Moderate	Slight	Slight	Yellow-poplar	100	Yellow-poplar, loblolly pine, eastern white pine.
Sewanee Variant						Southern red oak	80	
						Sweetgum	90	
						Loblolly pine	85	
						Shortleaf pine	80	
						Eastern white pine	90	
St	2o	Slight	Slight	Slight	Slight	Yellow-poplar	100	Yellow-poplar, black walnut, loblolly pine.
Staser						White oak	80	
						Loblolly pine	90	
						Black walnut	---	
TaC, TaD	3c	Slight	Moderate	Moderate	Slight	Northern red oak	65	Loblolly pine, shortleaf pine, Virginia pine, eastern redcedar, loblolly pine.
Talbott						Loblolly pine	80	
						Shortleaf pine	64	
						Virginia pine	70	
						Eastern redcedar	46	
TrD*:								
Talbott	3c	Slight	Moderate	Moderate	Slight	Northern red oak	65	Loblolly pine, shortleaf pine, Virginia pine, eastern redcedar, loblolly pine.
						Loblolly pine	80	
						Shortleaf pine	64	
						Virginia pine	70	
						Eastern redcedar	46	
Rock outcrop.								
Tu	3w	Slight	Moderate	Moderate	Slight	Yellow-poplar	90	Loblolly pine.
Tupelo						Loblolly pine	80	
						Sweetgum	80	
						White oak	70	
						Southern red oak	70	
WaB, WaD	3o	Slight	Slight	Slight	Slight	Yellow-poplar	90	Yellow-poplar, black walnut, loblolly pine, Virginia pine, shortleaf pine.
Waynesboro						White oak	75	
						Loblolly pine	80	
						Shortleaf pine	70	
						Virginia pine	75	
WeB	3x	Slight	Moderate	Moderate	Slight	Yellow-poplar	90	Loblolly pine, shortleaf pine.
Welchland						White oak	70	
						Loblolly pine	80	
						Shortleaf pine	70	
						Virginia pine	70	
Wh	2w	Slight	Moderate	Moderate	Slight	Yellow-poplar	95	Loblolly pine, eastern white pine, sweetgum.
Whitwell						Northern red oak	75	
						Sweetgum	90	
						Loblolly pine	90	
						Eastern white pine	90	
Wo	3w	Slight	Moderate	Moderate	Slight	Yellow-poplar	90	Loblolly pine.
Woodmont						Loblolly pine	85	
						Sweetgum	80	
						Shortleaf pine	60	
						Willow oak	80	

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 7.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AeC---- Allen	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----	Moderate: slope.
AeD---- Allen	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
AeE---- Allen	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ApC---- Apison	Slight----	Slight----	Severe: slope.	Slight----	Moderate: thin layer, slope.
ArB*. Arents					
AuD---- Armuchee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
AuE---- Armuchee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
BaE*: Barfield----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, thin layer.
Rock outcrop.					
BoC---- Bodine	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Slight----	Severe: small stones.
BoD---- Bodine	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, slope.
BoE---- Bodine	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope.	Severe: small stones, slope.
BsD*: Bodine----	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Moderate: slope.	Severe: small stones, slope.
Shack----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
BuF*: Bouldin----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Gilpin----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CaB---- Capshaw	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight----	Slight.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
CbC--Colbert	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Slight.
CcD*: Colbert	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: slope.
Rock outcrop.					
CdC*: Colbert	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Slight.
Urban land.					
CoC--Collegedale	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight	Slight.
CoD--Collegedale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
CrB--Crossville	Slight	Slight	Moderate: slope, depth to rock.	Slight	Moderate: thin layer.
DeB--Dewey	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
DeD--Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Du--Dunning	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Ec--Emory	Severe: flooding.	Slight	Moderate: slope, flooding.	Slight	Moderate: flooding.
EdC--Enders	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Slight.
EeD--Enders	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Severe: slope.
EgC--Enders	Severe: small stones, percs slowly.	Severe: small stones, percs slowly.	Severe: slope, small stones, percs slowly.	Slight	Severe: small stones.
EhC*: Enders	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Slight	Slight.
Urban land.					

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
En Ennis	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty, flooding.
EtB Etowah	Slight	Slight	Moderate: slope.	Slight	Slight.
EtD Etowah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
FuB Fullerton	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
FuD Fullerton	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
FuE Fullerton	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
FwD*: Fullerton	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Urban land.					
GpD Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
GpE Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Gu Guthrie	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Ha Hamblen	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Slight	Moderate: flooding.
HcD Hanceville	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
HcE Hanceville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HoB Holston	Slight	Slight	Moderate: slope.	Slight	Slight.
HoD Holston	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
HuB Humphreys	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones.
LiB Lily	Slight	Slight	Moderate: slope, depth to rock.	Slight	Moderate: thin layer.
LiD Lily	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
LnB---------- Lonewood	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
Lo---------- Lobelville	Severe: flooding, wetness.	Moderate: wetness, small stones.	Severe: small stones.	Slight----------	Moderate: small stones, flooding.
MnB---------- Minvale	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight----------	Moderate: small stones.
MnD---------- Minvale	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
MoE---------- Montevallo	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, erodes easily.	Severe: droughty, slope, thin layer.
Ne---------- Newark	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
NsB---------- Nesbitt	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight----------	Slight.
Pt*. Pits					
RaD---------- Ramsey	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.	Severe: slope, thin layer.
RcF*: Ramsey----------	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, thin layer.
Rock outcrop.					
RoA---------- Roane	Severe: flooding.	Moderate: wetness, small stones.	Severe: small stones.	Slight----------	Moderate: small stones, large stones, flooding.
RoB---------- Roane	Severe: flooding.	Moderate: wetness, small stones.	Severe: small stones.	Slight----------	Moderate: small stones, large stones.
SeB---------- Sequatchie	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
SfB*: Sequatchie----------	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
Urban land.					
SmD---------- Sequoia	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, thin layer.

See footnote at end of table.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Sn--- Sewanee Variant	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: flooding.
St--- Staser	Severe: flooding.	Slight---	Moderate: flooding.	Slight---	Moderate: flooding.
TaC--- Talbott	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Slight---	Moderate: thin layer.
TaD--- Talbott	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
TrD*: Talbott---	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Rock outcrop.					
Tu--- Tupelo	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness, flooding.
UPF*: Udorthents.					
Pits.					
Ur*. Urban land					
WaB--- Waynesboro	Slight---	Slight---	Moderate: slope.	Slight---	Slight.
WaD--- Waynesboro	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
WeB--- Welchland	Severe: flooding.	Moderate: large stones, small stones.	Severe: large stones, small stones.	Slight---	Moderate: small stones, large stones, droughty.
Wh--- Whitwell	Severe: flooding.	Moderate: wetness.	Moderate: small stones, flooding.	Slight---	Moderate: flooding.
Wo--- Woodmont	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AeC---- Allen	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
AeD---- Allen	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
AeE---- Allen	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
ApC---- Apison	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ArB*. Arents										
AuD---- Armuchee	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
AuE---- Armuchee	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
BaE*: Barfield----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
BoC---- Bodine	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
BoD---- Bodine	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
BoE---- Bodine	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
BsD*: Bodine----	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Shack----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BuF*: Bouldin----	Very poor.	Very poor.	Fair	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.
Gilpin----	Very poor.	Poor	Good	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
CaB---- Capshaw	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
CbC---- Colbert	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CcD*: Colbert----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Rock outcrop.										

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
CdC*: Colbert	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
CoC---- Collegedale	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CoD---- Collegedale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
CrB---- Crossville	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DeB---- Dewey	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
DeD---- Dewey	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Du---- Dunning	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ec---- Emory	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EdC---- Enders	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EeD---- Enders	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
EgC---- Enders	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
EhC*: Enders	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
En---- Ennis	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
EtB---- Etowah	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EtD---- Etowah	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FuB---- Fullerton	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
FuD---- Fullerton	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FuE---- Fullerton	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
FwD*: Fullerton	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Urban land.										

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
GpD---- Gilpin	Poor	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
GpE---- Gilpin	Very poor.	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Gu---- Guthrie	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Ha---- Hamblen	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
HcD---- Hanceville	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HcE---- Hanceville	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HoB---- Holston	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HoD---- Holston	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
HuB---- Humphreys	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LiB---- Lily	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LiD---- Lily	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
LnB---- Lonewood	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Lo---- Lobelville	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MnB---- Minvale	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MnD---- Minvale	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MoE---- Montevallo	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Ne---- Newark	Fair	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
NsB---- Nesbitt	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pt*. Pits										
RaD---- Ramsey	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.
RcF*: Ramsey----	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.
Rock outcrop.										

See footnote at end of table.

TABLE 8.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
RoA---- Roane	Fair	Good	Good	Fair	Fair	Poor	Poor	Good	Good	Poor.
RoB---- Roane	Good	Good	Good	Fair	Fair	Poor	Very poor.	Good	Good	Very poor.
SeB---- Sequatchie	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SfB*: Sequatchie--------	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Urban land.										
SmD---- Sequoia	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Sn---- Sewanee Variant	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
St---- Staser	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
TaC---- Talbott	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
TaD---- Talbott	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
TrD*: Talbott----------	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop.										
Tu---- Tupelo	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
UPF*: Udorthents.										
Pits.										
Ur*. Urban land										
WaB---- Waynesboro	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WaD---- Waynesboro	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WeB---- Welchland	Fair	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Wh---- Whitwell	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Wo---- Woodmont	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AeC---------- Allen	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
AeD, AeE---------- Allen	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
ApC---------- Apison	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Moderate: low strength.	Moderate: thin layer.
ArB*. Arents						
AuD, AuE---------- Armuchee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
BaE*: Barfield---------	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, low strength, slope.	Severe: slope, thin layer.
Rock outcrop.						
BoC---------- Bodine	Moderate: large stones, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: small stones.
BoD, BoE---------- Bodine	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
BsD*: Bodine----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, slope.
Shack----------	Severe: slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: slope.	Severe: slope.
BuF*: Bouldin----------	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope, slippage.	Severe: slope.
Gilpin----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
CaB---------- Capshaw	Moderate: depth to rock, too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
CbC---------- Colbert	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: droughty.
CcD*: Colbert----------	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: slope, droughty.
Rock outcrop.						

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
CdC*: Colbert	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: droughty.
Urban land.						
CoC--- Collegedale	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
CoD--- Collegedale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
CrB--- Crossville	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: depth to rock.	Moderate: depth to rock.	Moderate: thin layer.
DeB--- Dewey	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
DeD--- Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, low strength.	Severe: slope.
Du--- Dunning	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
Ec--- Emory	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: low strength, flooding.	Moderate: flooding.
EdC--- Enders	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
EeD--- Enders	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.	Severe: slope.
EgC--- Enders	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Severe: small stones.
EhC*: Enders	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Slight.
Urban land.						
En--- Ennis	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: small stones, droughty, flooding.
EtB--- Etowah	Slight---	Slight---	Slight---	Slight---	Moderate: low strength.	Slight.
EtD--- Etowah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
FuB--- Fullerton	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Severe: small stones.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
FuD, FuE---------- Fullerton	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: small stones, slope.
FwD*: Fullerton--------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: small stones, slope.
Urban land.						
GpD, GpE---------- Gilpin	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Gu---------- Guthrie	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
Ha---------- Hamblen	Moderate: depth to rock, wetness, flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
HcD, HcE---------- Hanceville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
HoB---------- Holston	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
HoD---------- Holston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
HuB---------- Humphreys	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: small stones.
LiB---------- Lily	Severe: depth to rock.	Moderate: depth to rock.	Severe: depth to rock.	Moderate: slope, depth to rock.	Moderate: depth to rock.	Moderate: thin layer.
LiD---------- Lily	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
LnB---------- Lonewood	Moderate: depth to rock.	Slight---------	Moderate: depth to rock.	Moderate: slope.	Moderate: low strength.	Slight.
Lo---------- Lobelville	Moderate: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: small stones, flooding.
MnB---------- Minvale	Slight---------	Slight---------	Slight---------	Moderate: slope.	Moderate: low strength.	Moderate: small stones.
MnD---------- Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MoE---------- Montevallo	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope, thin layer.
Ne---------- Newark	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
NsB---------- Nesbitt	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
Pt*. Pits						
RaD---------- Ramsey	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
RcF*: Ramsey----------	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, thin layer.
Rock outcrop.						
RoA---------- Roane	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: small stones, large stones, flooding.
RoB---------- Roane	Moderate: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Moderate: small stones, large stones.
SeB---------- Sequatchie	Slight---------	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Slight.
SfB*: Sequatchie-------	Slight---------	Slight---------	Slight---------	Moderate: slope.	Slight---------	Slight.
Urban land.						
SmD---------- Sequoia	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope, thin layer.
Sn---------- Sewanee Variant	Severe: depth to rock, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness, depth to rock.	Severe: flooding, wetness.	Severe: flooding.	Moderate: flooding.
St---------- Staser	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
TaC---------- Talbott	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: low strength.	Moderate: thin layer.
TaD---------- Talbott	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
TrD*: Talbott----------	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop.						
Tu---------- Tupelo	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: low strength, flooding, shrink-swell.	Moderate: wetness, flooding.

See footnote at end of table.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
UPF*: Udorthents.						
Pits.						
Ur*. Urban land						
WaB---------- Waynesboro	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
WaD---------- Waynesboro	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
WeB---------- Welchland	Moderate: large stones.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: small stones, large stones, droughty.
Wh---------- Whitwell	Moderate: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Wo---------- Woodmont	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AeC---------- Allen	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
AeD, AeE---------- Allen	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
ApC---------- Apison	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, thin layer.
ArB*. Arents					
AuD, AuE---------- Armuchee	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
BaE*: Barfield----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Rock outcrop.					
BoC---------- Bodine	Moderate: slope, large stones.	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: seepage.	Poor: small stones.
BoD, BoE---------- Bodine	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: small stones, slope.
BsD*: Bodine----------	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: small stones, slope.
Shack----------	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: slope.	Severe: slope.	Poor: slope.
BuF*: Bouldin----------	Severe: slope, slippage.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: large stones, slope.
Gilpin----------	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: slope, area reclaim, thin layer.
CaB---------- Capshaw	Severe: percs slowly.	Moderate: depth to rock, slope.	Severe: depth to rock, wetness, too clayey.	Moderate: depth to rock, wetness.	Poor: too clayey, hard to pack.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
CbC---------- Colbert	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
CcD*: Colbert----------	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
Rock outcrop.					
CdC*: Colbert----------	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
Urban land.					
CoC---------- Collegedale	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight----------	Poor: too clayey, hard to pack.
CoD---------- Collegedale	Severe: percs slowly, slope.	Severe: slope.	Severe: too clayey, slope.	Severe: slope.	Poor: too clayey, hard to pack, slope.
CrB---------- Crossville	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, thin layer.
DeB---------- Dewey	Moderate: percs slowly.	Moderate: slope, seepage.	Moderate: too clayey.	Slight----------	Fair: too clayey, hard to pack.
DeD---------- Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Du---------- Dunning	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
Ec---------- Emory	Severe: flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Fair: too clayey.
EdC---------- Enders	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
EeD---------- Enders	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
EgC---------- Enders	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
EhC*: Enders----------	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock.	Poor: too clayey, hard to pack.
Urban land.					

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
En Ennis	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Fair: small stones.
EtB Etowah	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
EtD Etowah	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
FuB Fullerton	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Fair: small stones, too clayey.
FuD Fullerton	Severe: slope.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope.
FuE Fullerton	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: slope.
FwD*: Fullerton	Severe: slope.	Severe: slope.	Severe: too clayey.	Severe: slope.	Poor: slope.
Urban land.					
GpD, GpE Gilpin	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Poor: slope, area reclaim, thin layer.
Gu Guthrie	Severe: flooding, wetness, percs slowly.	Slight	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Ha Hamblen	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, depth to rock, wetness.	Severe: flooding, wetness.	Fair: wetness.
HcD, HcE Hanceville	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
HoB Holston	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
HoD Holston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
HuB Humphreys	Moderate: flooding, wetness.	Severe: seepage, flooding.	Severe: seepage, wetness.	Severe: seepage.	Fair: too clayey, small stones.
LiB Lily	Severe: depth to rock.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim.
LiD Lily	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
LnB---------- Lonewood	Moderate: depth to rock, percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Fair: area reclaim, too clayey.
Lo---------- Lobelville	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: small stones, wetness.
MnB---------- Minvale	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, small stones.
MnD---------- Minvale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MoE---------- Montevallo	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, thin layer.
Ne---------- Newark	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
NsB---------- Nesbitt	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.
Pt*. Pits					
RaD---------- Ramsey	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
RcF*: Ramsey----------	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
Rock outcrop.					
RoA---------- Roane	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Poor: small stones.
RoB---------- Roane	Severe: wetness, percs slowly.	Severe: flooding, wetness.	Moderate: flooding, wetness, too clayey.	Moderate: flooding, wetness.	Poor: small stones.
SeB---------- Sequatchie	Moderate: flooding.	Severe: flooding.	Moderate: flooding, too clayey.	Severe: seepage.	Good.
SfB*: Sequatchie----------	Slight----------	Moderate: seepage, slope.	Moderate: too clayey.	Severe: seepage.	Good.
Urban land.					

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
SmD---------- Sequoia	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Moderate: slope.	Poor: area reclaim, too clayey, hard to pack.
Sn---------- Sewanee Variant	Severe: flooding, depth to rock, wetness.	Severe: depth to rock, flooding, wetness.	Severe: flooding, depth to rock, wetness.	Severe: flooding, depth to rock, wetness.	Poor: area reclaim, wetness, thin layer.
St---------- Staser	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Good.
TaC---------- Talbott	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
TaD---------- Talbott	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
TrD*: Talbott----------	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Rock outcrop.					
Tu---------- Tupelo	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, depth to rock, wetness.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
UPF*: Udorthents.					
Pits.					
Ur*. Urban land					
WaB---------- Waynesboro	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey, hard to pack.
WaD---------- Waynesboro	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
WeB---------- Welchland	Moderate: flooding, large stones.	Severe: seepage, flooding.	Severe: seepage.	Severe: seepage.	Poor: small stones.
Wh---------- Whitwell	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
Wo---------- Woodmont	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AeC---------- Allen	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
AeD---------- Allen	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
AeE---------- Allen	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
ApC---------- Apison	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, thin layer.
ArB* Arents				
AuD---------- Armuchee	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
AuE---------- Armuchee	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
BaE*: Barfield----------	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey, small stones.
Rock outcrop.				
BoC---------- Bodine	Fair: large stones.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
BoD---------- Bodine	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BoE---------- Bodine	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
BsD*: Bodine----------	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Shack----------	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
BuF*:				
Bouldin	Poor: slope.	Improbable: excess fines, large stones.	Improbable: excess fines, large stones.	Poor: area reclaim, small stones, slope.
Gilpin	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
CaB	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Capshaw				
CbC	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Colbert				
CcD*:				
Colbert	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Rock outcrop.				
CdC*:				
Colbert	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Urban land.				
CoC	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Collegedale				
CoD	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Collegedale				
CrB	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, thin layer.
Crossville				
DeB	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Dewey				
DeD	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Dewey				
Du	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
Dunning				
Ec	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Emory				
EdC	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Enders				
EeD	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
Enders				
EgC	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, small stones.
Enders				

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
EhC*: Enders	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
Urban land.				
En---------- Ennis	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
EtB---------- Etowah	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
EtD---------- Etowah	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
FuB---------- Fullerton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
FuD---------- Fullerton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
FuE---------- Fullerton	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
FwD*: Fullerton----------	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Urban land.				
GpD---------- Gilpin	Poor: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
GpE---------- Gilpin	Poor: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, small stones.
Gu---------- Guthrie	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Ha---------- Hamblen	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
HcD---------- Hanceville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
HcE---------- Hanceville	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
HoB---- Holston	Good----	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, area reclaim.
HoD---- Holston	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
HuB---- Humphreys	Good----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
LiB---- Lily	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
LiD---- Lily	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
LnB---- Lonewood	Fair: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Lo---- Lobelville	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MnB---- Minvale	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
MnD---- Minvale	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
MoE---- Montevallo	Poor: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, thin layer.
Ne---- Newark	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
NsB---- Nesbitt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Pt*. Pits				
RaD---- Ramsey	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
RcF*: Ramsey----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, slope.
Rock outcrop.				
RoA, RoB---- Roane	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SeB---- Sequatchie	Good----	Improbable: excess fines.	Improbable: excess fines.	Good.

See footnote at end of table.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
SfB*: Sequatchie	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
Urban land.				
SmD--- Sequoia	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Sn--- Sewanee Variant	Poor: area reclaim, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, thin layer.
St--- Staser	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
TaC--- Talbott	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
TaD--- Talbott	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
TrD*: Talbott	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				
Tu--- Tupelo	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
UPF*: Udorthents.				
Pits.				
Ur*. Urban land				
WaB--- Waynesboro	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
WaD--- Waynesboro	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
WeB--- Welchland	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Wh--- Whitwell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Wo--- Woodmont	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AeC, AeD---------- Allen	Moderate: seepage.	Severe: piping.	Deep to water	Slope---------	Slope---------	Slope.
AeE---------- Allen	Severe: slope.	Severe: piping.	Deep to water	Slope---------	Slope---------	Slope.
ApC---------- Apison	Moderate: seepage, depth to rock.	Severe: thin layer, piping.	Deep to water	Depth to rock, slope, erodes easily	Depth to rock, erodes easily	Erodes easily, depth to rock
ArB*. Arents						
AuD---------- Armuchee	Moderate: depth to rock.	Severe: thin layer, hard to pack.	Deep to water	Depth to rock, slope, erodes easily	Slope, depth to rock erodes easily	Slope, erodes easily depth to rock
AuE---------- Armuchee	Severe: slope.	Severe: thin layer, hard to pack.	Deep to water	Depth to rock, slope, erodes easily	Slope, depth to rock erodes easily	Slope, erodes easily depth to rock
BaE*: Barfield---------	Severe: depth to rock, slope.	Severe: thin layer, hard to pack.	Deep to water	Depth to rock, slope.	Slope, depth to rock	Slope, depth to rock
Rock outcrop.						
BoC, BoD---------- Bodine	Severe: seepage.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
BoE---------- Bodine	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
BsD*: Bodine----------	Severe: seepage.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Shack----------	Severe: slope.	Moderate: piping, wetness.	Slope---------	Slope---------	Slope---------	Slope.
BuF*: Bouldin----------	Severe: seepage, slope.	Severe: large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Gilpin----------	Severe: slope.	Severe: thin layer.	Deep to water	Slope, depth to rock	Slope, depth to rock large stones.	Slope, depth to rock large stones.
CaB---------- Capshaw	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Erodes easily, percs slowly.	Erodes easily, percs slowly.
CbC---------- Colbert	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Erodes easily, percs slowly.	Erodes easily, percs slowly.

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
CcD*:						
Colbert	Severe: slope.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Slope, erodes easily percs slowly.	Slope, erodes easily percs slowly.
Rock outcrop.						
CdC*:						
Colbert	Moderate: depth to rock, slope.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Urban land.						
CoC Collegedale	Slight	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Erodes easily, percs slowly.	Erodes easily, percs slowly.
CoD Collegedale	Slight	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Slope, erodes easily percs slowly.	Erodes easily, slope, percs slowly.
CrB Crossville	Severe: seepage.	Severe: piping, thin layer.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
DeB Dewey	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Favorable	Favorable.
DeD Dewey	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope	Slope	Slope.
Du Dunning	Slight	Severe: wetness.	Percs slowly, flooding.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
Ec Emory	Moderate: seepage.	Severe: piping.	Deep to water	Flooding	Erodes easily	Erodes easily.
EdC Enders	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Erodes easily, percs slowly.	Erodes easily, percs slowly.
EeD Enders	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Slope, erodes easily percs slowly.	Slope, erodes easily percs slowly.
EgC Enders	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly, slope.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
EhC*:						
Enders	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Percs slowly, slope, erodes easily	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Urban land.						
En Ennis	Severe: seepage.	Severe: piping.	Deep to water	Droughty, flooding.	Favorable	Favorable.
EtB Etowah	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily	Erodes easily	Erodes easily.
EtD Etowah	Moderate: seepage.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily	Slope, erodes easily	Slope, erodes easily

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
FuB---------- Fullerton	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----------	Favorable-----	Favorable.
FuD---------- Fullerton	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
FuE---------- Fullerton	Severe: slope.	Severe: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
FwD*: Fullerton--------	Severe: slope.	Severe: hard to pack.	Deep to water	Slope----------	Slope----------	Slope.
Urban land.						
GpD, GpE---------- Gilpin	Severe: slope.	Severe: thin layer.	Deep to water	Slope, depth to rock	Slope, depth to rock large stones.	Slope, depth to rock large stones.
Gu---------- Guthrie	Slight---------	Severe: piping, wetness.	Percs slowly, flooding.	Wetness, percs slowly, rooting depth	Erodes easily, wetness, rooting depth	Wetness, erodes easily rooting depth
Ha---------- Hamblen	Moderate: seepage.	Severe: piping.	Flooding------	Wetness, flooding.	Wetness-------	Favorable.
HcD, HcE---------- Hanceville	Severe: slope.	Slight---------	Deep to water	Slope----------	Slope----------	Slope.
HoB---------- Holston	Moderate: seepage.	Severe: piping.	Deep to water	Slope----------	Favorable-----	Favorable.
HoD---------- Holston	Moderate: seepage.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.
HuB---------- Humphreys	Severe: seepage.	Moderate: piping.	Deep to water	Slope----------	Favorable-----	Favorable.
LiB---------- Lily	Severe: seepage.	Severe: piping.	Deep to water	Depth to rock, slope.	Depth to rock	Depth to rock.
LiD---------- Lily	Severe: seepage, slope.	Severe: piping.	Deep to water	Depth to rock, slope.	Slope, depth to rock	Slope, depth to rock
LnB---------- Lonewood	Moderate: seepage, depth to rock, slope.	Moderate: piping.	Deep to water	Slope, erodes easily	Erodes easily	Erodes easily.
Lo---------- Lobelville	Moderate: seepage.	Severe: piping.	Flooding------	Wetness, flooding.	Wetness-------	Wetness.
MnB---------- Minvale	Moderate: seepage.	Severe: piping.	Deep to water	Droughty, slope.	Favorable-----	Favorable.
MnD---------- Minvale	Moderate: seepage.	Severe: piping.	Deep to water	Droughty, slope.	Slope----------	Slope.
MoE---------- Montevallo	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Droughty, depth to rock slope.	Slope, depth to rock erodes easily	Slope, erodes easily droughty.
Ne---------- Newark	Moderate: seepage.	Severe: piping, wetness.	Flooding------	Wetness, erodes easily flooding.	Erodes easily, wetness.	Wetness, erodes easily

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
NsB---------- Nesbitt	Moderate: seepage.	Moderate: thin layer, piping, wetness.	Slope---------	Wetness, slope, erodes easily	Erodes easily, wetness.	Erodes easily.
Pt*. Pits						
RaD---------- Ramsey	Severe: depth to rock.	Severe: piping.	Deep to water	Droughty, depth to rock slope.	Slope, depth to rock	Slope, droughty, depth to rock
RcF*: Ramsey----------	Severe: depth to rock, slope.	Severe: piping.	Deep to water	Droughty, depth to rock slope.	Slope, depth to rock	Slope, droughty, depth to rock
Rock outcrop.						
RoA---------- Roane	Moderate: seepage.	Moderate: large stones, wetness.	Percs slowly, flooding.	Wetness, droughty, percs slowly.	Large stones, wetness, rooting depth	Large stones, droughty, rooting depth
RoB---------- Roane	Moderate: seepage.	Moderate: large stones, wetness.	Percs slowly, slope.	Wetness, droughty, percs slowly.	Large stones, wetness, rooting depth	Large stones, droughty, rooting depth
SeB---------- Sequatchie	Severe: seepage.	Severe: piping.	Deep to water	Slope---------	Favorable-----	Favorable.
SfB*: Sequatchie-------	Severe: seepage.	Severe: piping.	Deep to water	Slope---------	Favorable-----	Favorable.
Urban land.						
SmD---------- Sequoia	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Depth to rock, slope, erodes easily	Slope, depth to rock erodes easily	Slope, erodes easily depth to rock
Sn---------- Sewanee Variant	Moderate: seepage, depth to rock.	Severe: thin layer, piping, wetness.	Depth to rock, flooding.	Wetness, depth to rock erodes easily	Depth to rock, erodes easily wetness.	Erodes easily, depth to rock
St---------- Staser	Severe: seepage.	Severe: piping.	Deep to water	Flooding------	Favorable-----	Favorable.
TaC---------- Talbott	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Depth to rock, slope.	Depth to rock, erodes easily	Erodes easily, depth to rock
TaD---------- Talbott	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Depth to rock, slope.	Slope, depth to rock erodes easily	Slope, erodes easily depth to rock
TrD*: Talbott----------	Moderate: depth to rock.	Severe: hard to pack.	Deep to water	Depth to rock, slope.	Slope, depth to rock erodes easily	Slope, erodes easily depth to rock
Rock outcrop.						
Tu---------- Tupelo	Moderate: depth to rock.	Severe: hard to pack, wetness.	Percs slowly, flooding.	Wetness, percs slowly, erodes easily	Erodes easily, wetness, percs slowly.	Wetness, erodes easily percs slowly.
UPF*: Udorthents.						

See footnote at end of table.

TABLE 12.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
UPF*: Pits.						
Ur*. Urban land						
WaB---------- Waynesboro	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope---------	Favorable-----	Favorable.
WaD---------- Waynesboro	Moderate: seepage.	Severe: hard to pack.	Deep to water	Slope---------	Slope---------	Slope.
WeB---------- Welchland	Severe: seepage.	Severe: piping.	Deep to water	Large stones, droughty, slope.	Large stones	Large stones, droughty.
Wh---------- Whitwell	Moderate: seepage.	Severe: piping.	Flooding------	Wetness, flooding.	Wetness-------	Favorable.
Wo---------- Woodmont	Slight---------	Moderate: piping, wetness.	Percs slowly	Wetness, percs slowly, rooting depth	Erodes easily, wetness, rooting depth	Wetness, erodes easily rooting depth

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
AeC, AeD, AeE---- Allen	0-12	Loam----------	ML, CL-ML, SM, SM-SC	A-4	0-5	90-100	75-100	65-98	40-80	<26	NP-7
	12-74	Clay loam, sandy clay loam, loam.	CL-ML, CL	A-4, A-6, A-7-6	0-10	85-100	75-100	65-98	50-80	22-43	5-19
ApC---------- Apison	0-7	Loam----------	ML, CL, CL-ML	A-4	0	85-100	75-100	65-90	55-85	18-30	3-10
	7-28	Clay loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	85-100	75-100	70-95	60-90	20-40	4-18
	28-61	Weathered bedrock	---	---	---	---	---	---	---	---	---
ArB*. Arents											
AuD, AuE--------- Armuchee	0-8	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0-2	85-100	80-95	75-90	70-85	25-39	5-15
	8-17	Shaly silty clay, shaly silty clay loam.	MH, ML, CL, CH	A-6, A-7	0-2	65-85	60-80	55-80	50-70	37-65	13-35
	17-24	Very shaly silty clay, very shaly silty clay loam.	GM, GC, CL, ML	A-2, A-6, A-7	0-5	35-75	25-70	20-65	15-55	35-60	11-30
	24-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
BaE*: Barfield--------	0-5	Silty clay loam	CL, CH, MH	A-6, A-7	0-10	90-100	85-95	80-90	75-85	35-65	12-35
	5-16	Silty clay, clay, silty clay loam.	CH, MH, CL	A-7, A-6	0-15	70-100	65-90	60-85	55-80	35-70	14-40
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
BoC, BoD, BoE---- Bodine	0-10	Cherty silt loam	ML, CL-ML, GM, SM	A-4, A-2, A-1-B	5-25	30-90	20-75	20-67	20-62	<30	NP-7
	10-25	Cherty silt loam, cherty silty clay loam, stony silt loam.	GM-GC, GC, SC, SM-SC	A-1, A-2, A-4, A-6	20-45	30-70	20-65	20-55	15-45	20-38	3-15
	25-65	Cherty silty clay loam, cherty clay loam, very cherty silt loam.	GC, GM, SC, SM	A-2	20-55	20-70	15-65	15-45	12-35	26-42	8-16
BsD*: Bodine----------	0-10	Cherty silt loam	ML, CL-ML, GM, SM	A-4, A-2, A-1-B	5-25	30-90	20-75	20-67	20-62	<30	NP-7
	10-25	Cherty silt loam, cherty silty clay loam, stony silt loam.	GM-GC, GC, SC, SM-SC	A-1, A-2, A-4, A-6	20-45	30-70	20-65	20-55	15-45	20-38	3-15
	25-65	Cherty silty clay loam, cherty clay loam, very cherty silt loam.	GC, GM, SC, SM	A-2	20-55	20-70	15-65	15-45	12-35	26-42	8-16

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
BsD*:											
Shack	0-9	Cherty silt loam	SM, SM-SC, ML, GM	A-4	0	55-80	50-75	45-70	36-60	<30	NP-7
	9-31	Cherty clay loam, cherty silty clay loam, cherty loam.	CL, SC, SM, ML	A-6	0	60-80	50-80	40-75	36-75	30-40	11-16
	31-51	Cherty clay loam, cherty silty clay loam, cherty loam.	CL, SC, SM, ML	A-6, A-7-6	0-2	60-80	50-80	45-75	40-70	32-45	11-17
	51-67	Cherty clay loam, cherty clay.	CL, SC	A-6, A-7-6	0-5	60-80	50-80	45-80	40-75	35-49	15-25
BuF*:											
Bouldin	0-18	Stony loam	SM, ML, SM-SC, GM	A-2, A-4	10-30	65-85	55-85	40-65	30-55	18-25	2-7
	18-80	Stony clay loam, stony sandy clay loam, stony loam.	GC, SC	A-2, A-4, A-6	30-55	55-75	45-65	35-60	25-50	25-39	8-16
Gilpin	0-8	Silt loam	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	8-24	Channery loam, shaly silt loam, silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	24-30	Channery loam, very channery silt loam, very shaly silty clay loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	30-40	Weathered bedrock.	---	---	---	---	---	---	---	---	---
CaB Capshaw	0-4	Silt loam	ML, CL, CL-ML	A-4	0	90-100	85-100	80-95	75-85	18-30	3-10
	4-24	Silty clay loam, silty clay, silt loam.	ML, CL	A-6, A-7, A-4	0	90-100	85-100	80-95	75-85	30-45	8-20
	24-45	Clay, silty clay, silty clay loam.	CL, CH, MH	A-7	0	90-100	85-100	80-95	75-90	40-60	16-31
	45-60	Clay, silty clay loam, clay loam.	MH, CH, CL	A-7	0-3	85-100	80-100	75-95	70-90	40-68	18-36
CbC Colbert	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	95-100	85-100	80-100	60-90	25-35	6-15
	4-55	Clay	CH	A-7	0	98-100	85-100	85-100	70-100	50-80	30-60
	55	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
CcD*:											
Colbert	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	95-100	85-100	80-100	60-90	25-35	6-15
	4-55	Clay	CH	A-7	0	98-100	85-100	85-100	70-100	50-80	30-60
	55	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
CdC*:											
Colbert	0-4	Silt loam	CL, CL-ML	A-4, A-6	0	95-100	85-100	80-100	60-90	25-35	6-15
	4-55	Clay	CH	A-7	0	98-100	85-100	85-100	70-100	50-80	30-60
	55	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Urban land.											
CoC, CoD Collegedale	0-6	Silt loam	ML, CL-ML, CL	A-4, A-6	0-2	90-100	85-100	75-95	70-90	24-39	5-16
	6-80	Silty clay, clay	MH, CH, CL	A-7	0-2	95-100	90-100	80-95	75-95	41-80	18-46

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
CrB---------- Crossville	0-10	Loam----------	ML, CL-ML, SM, SM-SC	A-4	0-2	90-100	85-100	70-85	36-75	<25	NP-7
	10-28	Loam, clay loam, sandy clay loam.	CL, CL-ML, SM-SC, SC	A-4, A-6, A-2	0-2	90-100	85-100	75-90	30-70	18-35	4-13
	28-32	Sandy loam, loamy sand, sand.	SM-SC, SM	A-2, A-4	0-5	70-100	60-100	50-65	13-36	<20	NP-5
DeB, DeD---------- Dewey	0-4	Silt loam--------	CL-ML, CL	A-4, A-6	0	90-100	80-100	75-95	65-80	24-30	5-11
	4-60	Clay, silty clay	CH, CL, MH, ML	A-6, A-7	0-2	85-100	75-100	70-95	55-85	38-68	12-34
Du---------- Dunning	0-19	Silty clay loam	CL	A-6, A-7	0	100	95-100	90-100	85-95	34-42	15-22
	19-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	95-100	95-100	90-100	85-100	45-70	20-40
Ec---------- Emory	0-36	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0-2	95-100	90-100	85-100	80-95	25-40	4-15
	36-60	Silt loam, silty clay loam.	CL, ML, CL-ML	A-4, A-6	0-2	95-100	90-100	85-100	80-95	25-40	4-15
EdC---------- Enders	0-10	Silt loam--------	ML, SM, SM-SC, CL-ML	A-4	0	80-100	80-97	75-90	40-85	20-35	2-10
	10-47	Silty clay, clay	CH	A-7	0	95-100	85-100	85-100	70-95	65-80	35-45
	47-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
EeD---------- Enders	0-5	Silt loam--------	ML, SM, SM-SC, CL-ML	A-4	0	80-100	80-97	75-90	40-85	20-35	2-10
	5-41	Silty clay, clay	CH	A-7	0	95-100	85-100	85-100	70-95	65-80	35-45
	41-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
EgC---------- Enders	0-12	Gravelly loam----	ML, SM, SM-SC, CL-ML	A-2, A-4	0-15	50-95	35-75	30-70	30-60	20-35	2-10
	12-55	Silty clay, clay	CH	A-7	0	95-100	85-100	85-100	70-95	65-80	35-45
	55-65	Weathered bedrock.	---	---	---	---	---	---	---	---	---
EhC*: Enders----------	0-10	Silt loam--------	ML, SM, SM-SC, CL-ML	A-4	0	80-100	80-97	75-90	40-85	20-35	2-10
	10-47	Silty clay, clay	CH	A-7	0	95-100	85-100	85-100	70-95	65-80	35-45
	47-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Urban land.											
En---------- Ennis	0-6	Cherty silt loam	CL-ML, ML, SM, GM	A-4, A-6	0-5	55-85	50-85	40-80	35-70	<30	NP-12
	6-60	Cherty silt loam, cherty loam, cherty clay loam.	ML, SM, GM, CL-ML	A-4, A-6, A-2	0-5	55-95	40-85	40-80	30-70	<35	NP-15
EtB, EtD---------- Etowah	0-13	Silt loam--------	ML, CL, SM-SC, CL-ML	A-4	0	80-100	75-100	70-95	45-70	20-30	3-10
	13-40	Silty clay loam, clay loam, silt loam.	CL	A-6	0	80-100	75-100	70-95	65-85	25-35	10-15
	40-62	Silty clay loam, clay loam, clay.	CL, ML, MH	A-6, A-7	0	80-100	75-100	70-95	65-85	39-60	15-25

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
FuB, FuD, FuE---- Fullerton	0-10	Cherty silt loam	ML, CL-ML, CL, GM	A-2, A-4	2-15	60-90	45-80	40-75	30-70	18-30	3-10
	10-14	Cherty silty clay loam, cherty silt loam.	CL, GC, SC, ML	A-2, A-4, A-6, A-7	2-18	60-90	45-80	40-75	30-70	29-42	8-17
	14-65	Cherty clay, cherty silty clay.	MH, ML, GM, SM	A-2, A-7	2-18	60-90	45-80	40-75	30-75	48-78	20-42
FwD*: Fullerton-------	0-10	Cherty silt loam	ML, CL-ML, CL, GM	A-2, A-4	2-15	60-90	45-80	40-75	30-70	18-30	3-10
	10-14	Cherty silty clay loam, cherty silt loam.	CL, GC, SC, ML	A-2, A-4, A-6, A-7	2-18	60-90	45-80	40-75	30-70	29-42	8-17
	14-65	Cherty clay, cherty silty clay.	MH, ML, GM, SM	A-2, A-7	2-18	60-90	45-80	40-75	30-75	48-78	20-42
Urban land.											
GpD, GpE--------- Gilpin	0-8	Silt loam--------	CL, CL-ML	A-4, A-6	0-5	80-95	75-90	70-85	65-80	20-40	4-15
	8-24	Channery loam, shaly silt loam, silty clay loam.	GC, SC, CL, CL-ML	A-2, A-4, A-6	0-30	50-95	45-90	35-85	30-80	20-40	4-15
	24-30	Channery loam, very channery silt loam, very shaly silty clay loam.	GC, GM-GC	A-1, A-2, A-4, A-6	0-35	25-55	20-50	15-45	15-40	20-40	4-15
	30-40	Weathered bedrock.	---	---	---	---	---	---	---	---	---
Gu---------- Guthrie	0-6	Silt loam--------	ML, CL-ML	A-4	0	100	100	90-100	85-95	18-28	2-7
	6-30	Silt loam, silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	85-95	23-39	5-15
	30-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	90-100	85-100	80-100	70-95	20-42	5-20
Ha---------- Hamblen	0-10	Silt loam--------	CL, CL-ML, ML	A-4, A-6	0-2	90-100	80-100	65-95	55-85	22-33	3-14
	10-60	Silt loam, loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0-2	80-100	75-100	60-95	55-85	22-40	3-17
HcD, HcE--------- Hanceville	0-6	Loam----------	SM-SC, SC, CL, CL-ML	A-4	0	95-100	90-100	75-98	40-80	<25	NP-10
	6-52	Clay loam, sandy clay, clay.	CL	A-6, A-7	0	95-100	95-100	90-100	51-95	30-50	11-25
	52-64	Clay loam, sandy clay loam, fine sandy loam.	CL, CL-ML	A-4, A-6, A-7	0	95-100	95-100	85-95	51-80	25-45	5-20
	64	Weathered bedrock	---	---	---	---	---	---	---	---	---
HoB, HoD--------- Holston	0-8	Loam----------	ML, CL-ML, SM, SM-SC	A-4, A-2	0-5	80-100	75-100	65-100	30-75	<22	NP-6
	8-60	Loam, clay loam, sandy clay loam.	ML, CL-ML, SM, SM-SC	A-4, A-2	0-5	80-100	75-100	50-100	30-80	21-33	3-10
	60-75	Clay loam, loam, gravelly clay loam.	ML, CL, GC, SC	A-4, A-6, A-7, A-2	0-15	60-100	55-100	50-100	30-80	30-50	7-22
HuB---------- Humphreys	0-10	Cherty silt loam	ML, CL-ML, CL, GM-GC	A-4	0-5	60-75	55-75	50-70	35-55	18-28	3-10
	10-60	Cherty silty clay loam, cherty clay loam.	CL, GC, SC	A-6	0-5	55-75	50-75	45-70	40-60	28-40	10-16

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
LiB, LiD--------- Lily	0-12	Loam----------	ML	A-4	0-5	90-100	85-100	70-95	55-75	<35	NP-7
	12-30	Clay loam, sandy clay loam, loam.	SM, SC, ML, CL	A-4, A-6	0-5	90-100	85-100	75-100	40-80	<35	3-15
	30-37	Sandy clay loam, clay loam, gravelly sandy clay loam.	SM, SC, ML, CL	A-4, A-2, A-6, A-1-b	0-10	65-100	50-100	40-95	20-75	<35	3-15
	37	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
LnB----------	0-9	Silt loam--------	ML, CL-ML	A-4	0	100	90-100	85-100	75-90	18-26	3-9
Lonewood	9-32	Silt loam, silty clay loam, loam.	CL	A-4, A-6	0	100	90-100	85-95	70-90	25-39	9-18
	32-65	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	95-100	85-100	75-90	65-85	29-48	10-23
	65-70	Shaly clay loam, shaly silty clay loam, loam.	CL, GC, SC	A-2, A-4, A-6, A-7	5-25	45-90	25-85	25-80	25-75	25-48	9-23
	70	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Lo----------	0-10	Cherty silt loam	ML, CL-ML, GM, GM-GC	A-4	0-5	65-90	55-80	50-75	45-65	<30	NP-7
Lobelville	10-45	Cherty silt loam, cherty loam, cherty silty clay loam.	CL-ML, ML, GM, GM-GC	A-4, A-6	0-5	65-90	50-80	45-70	40-65	22-35	3-12
	45-62	Cherty silt loam, cherty loam, cherty sandy loam.	ML, CL-ML, GM, GM-GC	A-4, A-2, A-6, A-1	0-10	50-80	25-70	20-70	15-65	23-35	3-12
MnB, MnD---------	0-18	Cherty silt loam	ML, CL, GM, GC	A-4	0-5	55-80	50-75	40-70	36-60	<30	NP-10
Minvale	18-60	Cherty silty clay loam, cherty silt loam, cherty loam.	CL, CL-ML, GC, GM-GC	A-4, A-6	0-5	50-75	50-75	40-70	36-65	20-40	5-15
MoE----------	0-6	Shaly silt loam	SM-SC, SC, CL-ML, CL	A-4	0-5	60-88	50-75	45-70	40-65	<30	NP-10
Montevallo	6-18	Shaly silt loam, shaly loam, shaly silty clay loam.	GM-GC, GC, SM-SC, SC	A-2, A-4, A-6	0-5	35-70	23-50	15-45	15-40	20-40	2-15
	18-29	Weathered bedrock	---	---	---	---	---	---	---	---	---
Ne----------	0-6	Silt loam--------	ML, CL, CL-ML	A-4	0	95-100	90-100	80-100	55-95	<32	NP-10
Newark	6-60	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	70-95	22-42	3-20
NsB----------	0-9	Silt loam--------	ML, CL, CL-ML	A-4	0	100	95-100	80-95	75-90	18-30	3-10
Nesbitt	9-27	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	95-100	85-100	85-95	30-45	10-20
	27-45	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	100	95-100	80-95	75-95	30-45	10-20
	45-60	Clay, silty clay	MH, CH, CL	A-7	0	95-100	80-100	75-95	70-90	45-65	20-34
Pt*. Pits											
RaD----------	0-16	Loam----------	SM, CL-ML, ML, CL	A-4, A-2	0-10	85-100	75-95	60-75	34-70	18-25	2-8
Ramsey	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
RcF*:											
Ramsey	0-16	Loam	SM, CL-ML, ML, CL	A-4, A-2	0-10	85-100	75-95	60-75	34-70	18-25	2-8
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
RoA	0-6	Cherty loam	ML, CL-ML, GM, GM-GC	A-4	3-15	65-80	60-75	50-65	40-60	18-23	3-7
Roane	6-20	Cherty clay loam, cherty loam, cherty silty clay loam.	CL-ML, CL, GC, GM-GC	A-4, A-6	3-15	65-80	60-75	50-65	40-60	22-32	6-12
	20-60	Cherty clay loam, cherty loam, cherty silty clay loam.	GC, GM-GC	A-2, A-4, A-6	15-25	35-65	30-55	25-50	20-40	22-34	7-14
RoB	0-6	Cherty silt loam	ML, CL-ML, GM, GM-GC	A-4	3-15	65-80	60-75	50-65	40-60	18-23	3-7
Roane	6-20	Cherty clay loam, cherty loam, cherty silty clay loam.	CL-ML, CL, GC, GM-GC	A-4, A-6	3-15	65-80	60-75	50-65	40-60	22-32	6-12
	20-60	Cherty clay loam, cherty loam, cherty silty clay loam.	GC, GM-GC	A-2, A-4, A-6	15-25	35-65	30-55	25-50	20-40	22-34	7-14
SeB	0-9	Loam	ML, CL-ML, CL, SM	A-2, A-4	0-10	85-100	75-100	65-95	30-70	18-27	2-10
Sequatchie	9-46	Clay loam, loam, silt loam.	CL-ML, CL	A-4, A-6	0-10	85-100	75-100	65-95	55-85	20-32	5-15
	46-61	Sandy loam, loam, fine sandy loam.	ML, CL-ML, CL, SM	A-2, A-4	0-15	75-100	65-100	45-85	25-65	18-25	2-10
SfB*:											
Sequatchie	0-9	Loam	ML, CL-ML, CL, SM	A-2, A-4	0-10	85-100	75-100	65-95	30-70	18-27	2-10
	9-46	Clay loam, loam, silt loam.	CL-ML, CL	A-4, A-6	0-10	85-100	75-100	65-95	55-85	20-32	5-15
	46-61	Sandy loam, loam, fine sandy loam.	ML, CL-ML, CL, SM	A-2, A-4	0-15	75-100	65-100	45-85	25-65	18-25	2-10
Urban land.											
SmD	0-5	Silt loam	CL, CL-ML	A-4, A-6	0	95-100	95-100	85-100	80-95	23-35	5-15
Sequoia	5-36	Silty clay, clay, shaly silty clay.	CL, MH, CH	A-7	0	70-100	65-100	60-100	55-95	43-74	20-40
	36-50	Weathered bedrock	---	---	---	---	---	---	---	---	---
Sn	0-7	Silt loam	ML, CL-ML, CL, SM	A-4, A-6	0-3	85-100	75-100	65-95	45-85	20-35	3-12
Sewanee Variant	7-28	Silt loam, loam	ML, CL-ML, CL, SM	A-4, A-6	0-3	85-100	75-100	65-95	45-85	20-35	3-12
St	0-30	Loam	CL, CL-ML, ML	A-4, A-6	0	90-100	80-100	60-85	55-80	20-35	3-15
Staser	30-60	Silt loam, loam, fine sandy loam.	CL, CL-ML, SC, SM-SC	A-4, A-6, A-2	0-5	45-100	40-100	35-80	30-75	20-35	5-15

See footnote at end of table.

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
TaC, TaD--------- Talbott	0-6	Silt loam---------	CL, ML	A-4, A-6	0-5	95-100	90-100	85-95	75-95	25-40	8-16
	6-36	Clay, silty clay	CL, MH, CH	A-7	0-10	95-100	90-100	85-95	80-95	40-80	20-45
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
TrD*: Talbott---------	0-6	Silt loam---------	CL, ML	A-4, A-6	0-5	95-100	90-100	85-95	75-95	25-40	8-16
	6-36	Clay, silty clay	CL, MH, CH	A-7	0-10	95-100	90-100	85=95	80-95	40-80	20-45
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Tu--------------- Tupelo	0-8	Silt loam---------	CL-ML, CL, ML	A-4, A-6	0	98-100	85-100	75-100	70-95	20-35	4-12
	8-16	Silty clay loam, silty clay, silt loam.	CL, CH	A-6, A-7	0	100	95-100	90-100	85-95	35-55	15-30
	16-60	Clay, silty clay, silty clay loam.	CH, MH, CL	A-7, A-6	0	95-100	95-100	90-100	75-98	32-70	11-40
UPF*: Udorthents.											
Pits.											
Ur*. Urban land											
WaB, WaD--------- Waynesboro	0-9	Loam-------------	ML, CL-ML, CL, SM	A-4	0-5	85-100	80-100	70-95	43-70	18-29	2-9
	9-19	Clay loam, loam, sandy clay loam.	CL, ML, SC	A-4, A-6, A-7	0-5	90-100	85-100	75-95	45-75	30-41	9-17
	19-60	Clay loam, sandy clay, clay.	MH, CL, ML	A-4, A-6, A-7	0-5	90-100	80-100	70-98	55-75	35-68	9=32
WeB-------------- Welchland	0-6	Cobbly loam------	ML, CL-ML, SM, GM	A-4	10-30	75-95	65-85	55-75	40-60	<25	NP-6
	6-36	Cobbly loam, cobbly sandy loam, cobbly sandy clay loam.	CL-ML, CL, SC, SM-SC	A-4	10-30	75-90	60-85	50-75	35-60	18-29	5-10
	36-65	Cobbly loam, cobbly sandy loam, cobbly loamy sand.	SM, SM-SC, ML, CL-ML	A-4, A-2, A-1	15-40	60-90	40-80	30-65	20-55	<25	NP-6
Wh--------------- Whitwell	0-6	Loam-------------	ML, CL-ML, CL	A-4	0-3	80-100	75-100	70-100	55-95	18-28	3-10
	6-64	Clay loam, loam, silt loam.	CL, CL-ML, ML, SC	A-4, A-6	0-3	80-100	75-100	60-90	40-80	18-35	3-15
Wo--------------- Woodmont	0-5	Silt loam---------	CL, ML, CL-ML	A-4	0	100	95-100	90-100	30-90	20-30	3-10
	5-24	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	90-100	80-95	25-35	7-15
	24-60	Silt loam, silty clay loam.	CL	A-4, A-6	0-2	95-100	85-100	80-100	75-95	25-40	8-20

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
AeC, AeD, AeE----	0-12	6-25	1.30-1.50	0.6-2.0	0.14-0.19	4.5-5.5	Low----------	0.24	5	.5-3
Allen	12-74	18-35	1.40-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Low----------	0.20		
ApC----------	0-7	12-25	1.45-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.43	3	1-3
Apison	7-28	23-35	1.48-1.62	0.6-2.0	0.13-0.18	4.5-5.5	Low----------	0.37		
	28-61	---	---	---	---	---	----------	----		
ArB*.										
Arents										
AuD, AuE----------	0-8	22-32	1.35-1.45	0.6-2.0	0.15-0.20	4.5-5.5	Low----------	0.37	3	.5-2
Armuchee	8-17	37-47	1.40-1.50	0.2-0.6	0.10-0.14	4.5-5.5	Moderate-----	0.37		
	17-24	35-45	1.40-1.50	0.2-0.6	0.05-0.10	4.5-5.5	Moderate-----	0.32		
	24-60	---	---	---	---	---	----------	----		
BaE*:										
Barfield---------	0-5	35-55	1.50-1.62	0.2-0.6	0.10-0.15	6.1-7.8	Moderate-----	0.17	1	---
	5-16	35-55	1.55-1.65	0.2-0.6	0.09-0.14	6.1-7.8	High----------	0.17		
	16	---	---	---	---	---	----------	----		
Rock outcrop.										
BoC, BoD, BoE----	0-10	8-20	1.35-1.55	2.0-6.0	0.07-0.12	3.6-5.5	Low----------	0.28	5	---
Bodine	10-25	20-35	1.40-1.60	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.28		
	25-65	23-38	1.40-1.60	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.28		
BsD*:										
Bodine----------	0-10	8-20	1.35-1.55	2.0-6.0	0.07-0.12	3.6-5.5	Low----------	0.28	5	---
	10-25	20-35	1.40-1.60	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.28		
	25-65	23-38	1.40-1.60	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.28		
Shack----------	0-9	10-27	1.30-1.40	0.6-2.0	0.10-0.18	4.5-6.0	Low----------	0.28	3	1-2
	9-31	20-35	1.35-1.45	0.6-2.0	0.12-0.16	4.5-5.5	Low----------	0.28		
	31-51	20-40	1.50-1.60	0.2-0.6	0.10-0.14	4.5-5.5	Low----------	0.24		
	51-67	35-55	1.40-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Low----------	0.28		
BuF*:										
Bouldin---------	0-18	10-20	1.35-1.50	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.20	5	---
	18-80	17-35	1.40-1.55	2.0-6.0	0.06-0.10	4.5-5.5	Low----------	0.20		
Gilpin----------	0-8	15-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low----------	0.32	3	1-4
	8-24	18-35	1.20-1.50	0.6-2.0	0.10-0.16	3.6-5.5	Low----------	0.24		
	24-30	15-35	1.20-1.50	0.6-2.0	0.06-0.10	3.6-5.5	Low----------	0.24		
	30-40	---	---	---	---	---	----------	----		
CaB----------	0-4	15-27	1.35-1.50	0.6-2.0	0.18-0.22	5.1-6.0	Low----------	0.37	3	1-3
Capshaw	4-24	25-45	1.35-1.55	0.6-2.0	0.16-0.20	5.1-6.0	Low----------	0.37		
	24-45	35-55	1.40-1.55	0.06-0.2	0.12-0.18	5.1-6.0	Moderate-----	0.24		
	45-60	35-50	1.40-1.60	0.06-0.2	0.12-0.16	5.6-7.8	Moderate-----	0.24		
CbC----------	0-4	10-40	1.35-1.50	0.2-2.0	0.16-0.24	5.1-5.5	Moderate-----	0.43	2	.5-2
Colbert	4-55	60-75	1.35-1.50	<0.06	0.12-0.18	5.1-5.5	High----------	0.32		
	55	---	---	---	---	---	----------	----		
CcD*:										
Colbert---------	0-4	10-40	1.35-1.50	0.2-2.0	0.16-0.24	5.1-5.5	Moderate-----	0.43	2	.5-2
	4-55	60-75	1.35-1.50	<0.06	0.12-0.18	5.1-5.5	High----------	0.32		
	55	---	---	---	---	---	----------	----		
Rock outcrop.										

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
CdC*:										
Colbert	0-4	10-40	1.35-1.50	0.2-2.0	0.16-0.24	5.1-5.5	Moderate	0.43	2	.5-2
	4-55	60-75	1.35-1.50	<0.06	0.12-0.18	5.1-5.5	High	0.32		
	55	---	---	---	---	---	---	---		
Urban land.										
CoC, CoD	0-6	10-35	1.30-1.50	0.6-2.0	0.18-0.24	4.5-5.5	Low	0.37	5	.5-2
Collegedale	6-80	40-60	1.50-1.70	0.06-0.6	0.12-0.17	4.5-5.5	Moderate	0.24		
CrB	0-10	10-20	1.25-1.45	0.6-2.0	0.14-0.20	4.5-5.5	Low	0.20	2	2-4
Crossville	10-28	15-32	1.30-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Low	0.20		
	28-32	5-15	1.30-1.50	6.0-20	0.04-0.10	4.5-5.5	Low	0.20		
DeB, DeD	0-4	17-27	1.35-1.50	0.6-2.0	0.18-0.20	4.5-5.5	Low	0.32	5	1-3
Dewey	4-60	45-60	1.50-1.60	0.6-2.0	0.12-0.17	4.5-5.5	Moderate	0.24		
Du	0-19	27-40	1.20-1.40	0.6-2.0	0.19-0.23	5.6-7.8	Moderate	0.28	5	2-6
Dunning	19-60	35-60	1.40-1.65	0.06-0.2	0.14-0.18	5.6-7.8	Moderate	0.28		
Ec	0-36	20-35	1.20-1.40	0.6-2.0	0.17-0.21	5.1-6.0	Low	0.37	5	1-4
Emory	36-60	20-35	1.25-1.45	0.6-2.0	0.17-0.21	5.1-6.0	Low	0.37		
EdC	0-10	10-25	1.25-1.60	0.6-2.0	0.10-0.20	3.6-5.5	Low	0.37	3	.5-2
Enders	10-47	35-60	1.15-1.45	<0.06	0.12-0.18	3.6-5.5	High	0.37		
	47-60	---	---	---	---	---	---	---		
EeD	0-5	10-25	1.25-1.60	0.6-2.0	0.10-0.20	3.6-5.5	Low	0.37	3	.5-2
Enders	5-41	35-60	1.15-1.45	<0.06	0.12-0.18	3.6-5.5	High	0.37		
	41-60	---	---	---	---	---	---	---		
EgC	0-12	10-25	1.25-1.60	0.6-2.0	0.07-0.15	3.6-5.5	Low	0.32	3	.5-2
Enders	12-55	35-60	1.15-1.45	<0.06	0.12-0.18	3.6-5.5	High	0.37		
	55-65	---	---	---	---	---	---	---		
EhC*:										
Enders	0-10	10-25	1.25-1.60	0.6-2.0	0.10-0.20	3.6-5.5	Low	0.37	3	.5-2
	10-47	35-60	1.15-1.45	<0.06	0.12-0.18	3.6-5.5	High	0.37		
	47-60	---	---	---	---	---	---	---		
Urban land.										
En	0-6	12-25	1.30-1.45	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.28	5	1-3
Ennis	6-60	18-32	1.35-1.50	2.0-6.0	0.08-0.15	4.5-6.0	Low	0.28		
EtB, EtD	0-13	15-27	1.30-1.45	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.37	5	1-3
Etowah	13-40	23-35	1.35-1.50	0.6-2.0	0.16-0.20	4.5-5.5	Low	0.32		
	40-62	32-45	1.40-1.55	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.32		
FuB, FuD, FuE	0-10	15-27	1.45-1.55	0.6-2.0	0.10-0.16	4.5-5.5	Low	0.28	5	.5-2
Fullerton	10-14	23-35	1.45-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
	14-65	40-70	1.45-1.65	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.20		
FwD*:										
Fullerton	0-10	15-27	1.45-1.55	0.6-2.0	0.10-0.16	4.5-5.5	Low	0.28	5	.5-2
	10-14	23-35	1.45-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Low	0.24		
	14-65	40-70	1.45-1.65	0.6-2.0	0.10-0.14	4.5-5.5	Moderate	0.20		
Urban land.										
GpD, GpE	0-8	15-27	1.20-1.40	0.6-2.0	0.12-0.18	3.6-5.5	Low	0.32	3	.5-2
Gilpin	8-24	18-35	1.20-1.50	0.6-2.0	0.10-0.16	3.6-5.5	Low	0.24		
	24-30	15-35	1.20-1.50	0.6-2.0	0.06-0.10	3.6-5.5	Low	0.24		
	30-40	---	---	---	---	---	---	---		
Gu	0-6	10-25	1.35-1.55	0.6-2.0	0.20-0.22	3.6-5.0	Low	0.43	3	1-3
Guthrie	6-30	18-30	1.40-1.60	0.6-2.0	0.18-0.20	3.6-5.0	Low	0.43		
	30-60	18-32	1.60-1.75	0.06-0.2	0.03-0.05	3.6-5.0	Low	0.43		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm3	In/hr	In/in	pH				Pct
Ha	0-10	15-25	1.30-1.45	0.6-2.0	0.18-0.20	4.5-7.3	Low	0.32	5	1-3
Hamblen	10-60	18-32	1.30-1.45	0.6-2.0	0.17-0.20	4.5-7.3	Low	0.32		
HcD, HcE	0-6	12-27	1.30-1.40	0.6-2.0	0.14-0.20	4.5-6.5	Low	0.24	5	.5-2
Hanceville	6-52	35-50	1.35-1.45	0.6-2.0	0.14-0.20	4.5-5.5	Moderate	0.28		
	52-64	15-35	1.35-1.45	0.6-2.0	0.14-0.20	4.5-5.5	Moderate	0.24		
	64	---	---	---	---	---	---	---		
HoB, HoD	0-8	10-25	1.35-1.50	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.32	5	.5-2
Holston	8-60	18-35	1.40-1.55	0.6-2.0	0.13-0.20	4.5-5.5	Low	0.32		
	60-75	20-45	1.40-1.60	0.6-2.0	0.10-0.18	4.5-5.5	Low	0.32		
HuB	0-10	12-25	1.35-1.50	2.0-6.0	0.10-0.15	4.5-6.0	Low	0.20	5	2-4
Humphreys	10-60	18-32	1.35-1.55	2.0-6.0	0.09-0.14	4.5-6.0	Low	0.24		
LiB, LiD	0-12	7-27	1.20-1.40	0.6-6.0	0.13-0.18	3.6-5.5	Low	0.28	3	.5-2
Lily	12-30	18-35	1.25-1.55	2.0-6.0	0.12-0.18	3.6-5.5	Low	0.28		
	30-37	20-35	1.25-1.55	2.0-6.0	0.08-0.17	3.6-5.5	Low	0.17		
	37	---	---	---	---	---	---	---		
LnB	0-9	15-25	1.30-1.45	0.6-2.0	0.18-0.20	4.5-5.5	Low	0.37	4	1-3
Lonewood	9-32	20-39	1.30-1.45	0.6-2.0	0.15-0.18	4.5-5.5	Low	0.37		
	32-65	25-45	1.30-1.45	0.6-2.0	0.14-0.17	4.5-5.5	Low	0.32		
	65-70	25-45	1.30-1.45	0.6-2.0	0.05-0.11	4.5-5.5	Low	0.32		
	70	---	---	---	---	---	---	---		
Lo	0-10	12-25	1.30-1.45	0.6-2.0	0.10-0.15	4.5-6.0	Low	0.28	5	1-3
Lobelville	10-45	18-35	1.35-1.50	0.6-2.0	0.08-0.13	4.5-6.0	Low	0.28		
	45-62	18-35	1.35-1.50	0.6-2.0	0.06-0.14	4.5-6.0	Low	0.28		
MnB, MnD	0-18	15-30	1.30-1.45	2.0-6.0	0.10-0.15	4.5-5.5	Low	0.32	4	.5-2
Minvale	18-60	20-35	1.40-1.55	0.6-2.0	0.09-0.14	4.5-5.5	Low	0.28		
MoE	0-6	7-27	1.30-1.45	0.6-2.0	0.09-0.18	4.5-6.0	Low	0.37	2	.5-2
Montevallo	6-18	15-35	1.30-1.45	0.6-2.0	0.02-0.12	4.5-6.0	Low	0.32		
	18-28	---	---	---	---	---	---	---		
Ne	0-6	7-27	1.20-1.40	0.6-2.0	0.15-0.23	5.6-7.8	Low	0.43	5	1-3
Newark	6-60	18-35	1.20-1.45	0.6-2.0	0.18-0.23	5.6-7.8	Low	0.43		
NsB	0-9	15-30	1.35-1.45	0.6-2.0	0.18-0.22	5.1-5.5	Low	0.43	5	1-3
Nesbitt	9-27	20-32	1.40-1.55	0.6-2.0	0.17-0.20	5.1-5.5	Low	0.37		
	27-45	20-35	1.50-1.65	0.2-2.0	0.10-0.15	5.1-5.5	Low	0.37		
	45-60	40-55	1.45-1.60	0.2-0.6	0.10-0.15	5.1-6.5	Moderate	0.24		
Pt*. Pits										
RaD	0-16	8-25	1.20-1.40	6.0-20	0.09-0.12	4.5-5.5	Low	0.17	1	4.8
Ramsey	16	---	---	---	---	---	---	---		
RcF*:										
Ramsey	0-16	8-25	1.20-1.40	6.0-20	0.09-0.12	4.5-5.5	Low	0.17	1	4.8
	16	---	---	---	---	---	---	---		
Rock outcrop.										
RoA, RoB	0-6	15-25	1.35-1.50	0.6-2.0	0.11-0.17	4.5-5.5	Low	0.24	3	.5-2
Roane	6-20	18-32	1.40-1.60	0.6-2.0	0.11-0.17	4.5-5.5	Low	0.32		
	20-60	18-32	1.60-1.75	0.06-0.2	0.03-0.05	4.5-5.5	Low	0.32		
SeB	0-9	10-25	1.50-1.65	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.24	5	1-3
Sequatchie	9-46	18-30	1.55-1.70	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.24		
	46-61	12-25	1.55-1.70	0.6-6.0	0.09-0.14	4.5-5.5	Low	0.24		

See footnote at end of table.

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cm³	In/hr	In/in	pH				Pct
SfB*:										
Sequatchie	0-9	10-25	1.50-1.65	0.6-2.0	0.12-0.18	4.5-5.5	Low	0.24	5	1-3
	9-46	18-30	1.55-1.70	0.6-2.0	0.15-0.20	4.5-5.5	Low	0.24		
	46-61	12-25	1.55-1.70	0.6-6.0	0.09-0.14	4.5-5.5	Low	0.24		
Urban land.										
SmD	0-5	15-27	1.30-1.50	0.6-2.0	0.17-0.20	4.5-5.5	Low	0.37	3	.5-2
Sequoia	5-36	35-60	1.35-1.55	0.2-0.6	0.08-0.16	4.5-5.5	Moderate	0.24		
	36-50	---	---	---	---	---	---	---		
Sn	0-7	15-25	1.30-1.45	0.6-2.0	0.17-0.22	4.5-5.5	Low	0.37	3	1-3
Sewanee Variant	7-28	18-25	1.35-1.50	0.6-2.0	0.17-0.22	4.5-5.5	Low	0.37		
St	0-30	18-27	1.40-1.60	0.6-2.0	0.15-0.22	5.6-7.3	Low	0.32	5	2-4
Staser	30-60	18-27	1.40-1.60	0.6-6.0	0.07-0.18	5.6-7.3	Low	0.28		
TaC, TaD	0-6	15-27	1.35-1.50	0.6-2.0	0.10-0.18	5.1-6.0	Moderate	0.37	2	.5-2
Talbott	6-36	40-60	1.40-1.60	0.2-0.6	0.10-0.14	5.1-7.8	Moderate	0.24		
	36	---	---	---	---	---	---	---		
TrD*:										
Talbott	0-6	15-27	1.35-1.50	0.6-2.0	0.10-0.18	5.1-6.0	Moderate	0.37	2	.5-2
	6-36	40-60	1.40-1.60	0.2-0.6	0.10-0.14	5.1-7.8	Moderate	0.24		
	36	---	---	---	---	---	---	---		
Rock outcrop.										
Tu	0-8	18-32	1.35-1.50	0.6-2.0	0.18-0.22	4.5-6.0	Low	0.37	4	1-3
Tupelo	8-16	25-45	1.40-1.55	0.6-2.0	0.17-0.21	4.5-6.0	Moderate	0.32		
	16-60	35-65	1.40-1.60	0.06-0.2	0.12-0.16	5.1-8.4	High	0.28		
UPF*:										
Udorthents.										
Pits.										
Ur*.										
Urban land										
WaB, WaD	0-9	10-30	1.40-1.55	0.6-2.0	0.16-0.20	4.5-5.5	Low	0.24	5	.5-2
Waynesboro	9-19	23-35	1.40-1.55	0.6-2.0	0.12-0.16	4.5-5.5	Moderate	0.28		
	19-60	35-50	1.40-1.55	0.6-2.0	0.10-0.15	4.5-5.5	Moderate	0.28		
WeB	0-6	8-22	1.45-1.60	2.0-6.0	0.09-0.14	4.5-5.5	Low	0.17	5	1-3
Welchland	6-36	15-30	1.45-1.60	2.0-6.0	0.08-0.14	4.5-5.5	Low	0.17		
	36-65	5-20	1.45-1.60	2.0-6.0	0.05-0.11	4.5-5.5	Low	0.17		
Wh	0-6	10-25	1.35-1.55	0.6-2.0	0.15-0.20	4.5-6.0	Low	0.32	4	1-3
Whitwell	6-64	18-32	1.40-1.70	0.6-2.0	0.14-0.20	4.5-5.5	Low	0.32		
Wo	0-5	15-25	1.35-1.50	0.6-2.0	0.18-0.20	5.1-5.5	Low	0.43	3	.5-2
Woodmont	5-24	18-30	1.40-1.60	0.6-2.0	0.17-0.20	5.1-5.5	Low	0.43		
	24-60	18-35	1.60-1.75	.0.06-0.2	0.05-0.09	5.1-7.8	Low	0.43		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
AeC, AeD, AeE----- Allen	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
ApC---------- Apison	B	None--------	---	---	>6.0	---	---	20-40	Soft	Moderate	Moderate.
ArB*. Arents											
AuD, AuE---------- Armuchee	C	None--------	---	---	>6.0	---	---	20-36	Soft	Moderate	Moderate.
BaE*: Barfield---------	D	None--------	---	---	>6.0	---	---	8-20	Hard	High-----	Low.
Rock outcrop.											
BoC, BoD, BoE----- Bodine	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
BsD*: Bodine----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	High.
Shack----------	B	None--------	---	---	2.0-4.0	Perched	Jan-Mar	>60	---	Moderate	High.
BuF*: Bouldin----------	B	None--------	---	---	>6.0	---	---	>60	---	Low------	Moderate.
Gilpin----------	C	None--------	---	---	>6.0	---	---	20-40	Soft	Low------	High.
CaB---------- Capshaw	C	None--------	---	---	4.0-5.0	Apparent	Dec-Mar	48-60	Hard	High-----	Moderate.
CbC---------- Colbert	D	None--------	---	---	>6.0	---	---	40-60	Hard	High-----	Moderate.
CcD*: Colbert----------	D	None--------	---	---	>6.0	---	---	40-60	Hard	High-----	Moderate.
Rock outcrop.											
CdC*: Colbert----------	D	None--------	---	---	>6.0	---	---	40-60	Hard	High-----	Moderate.
Urban land.											
CoC, CoD---------- Collegedale	C	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
CrB---------- Crossville	B	None--------	---	---	>6.0	---	---	20-40	Hard	Low------	High.
DeB, DeD---------- Dewey	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Moderate.
Du---------- Dunning	D	Frequent----	Brief-----	Dec-May	0-0.5	Apparent	Jan-Apr	>60	---	High-----	Moderate.
Ec---------- Emory	B	Occasional	Very brief	Dec-Mar	5.0-6.0	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
EdC, EeD, EgC----- Enders	C	None--------	---	---	>6.0	---	---	40-60	Soft	High-----	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
EhC*: Enders	C	None	---	---	>6.0	---	---	40-60	Soft	High	High.
Urban land.											
En Ennis	B	Occasional	Very brief	Dec-Mar	>6.0	---	---	>60	---	Low	Moderate.
EtB, EtD Etowah	B	None	---	---	>6.0	---	---	>60	---	Low	Moderate.
FuB, FuD, FuE Fullerton	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
FwD*: Fullerton	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
Urban land.											
GpD, GpE Gilpin	C	None	---	---	>6.0	---	---	20-40	Soft	Low	High.
Gu Guthrie	D	Occasional	Brief	Jan-Apr	0.5-1.0	Perched	Jan-Apr	>60	---	High	High.
Ha Hamblen	C	Occasional	Very brief	Dec-Mar	2.0-3.0	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
HcD, HcE Hanceville	B	None	---	---	>6.0	---	---	>60	---	High	High.
HoB, HoD Holston	B	None	---	---	>6.0	---	---	>60	---	Moderate	High.
HuB Humphreys	B	Rare	---	---	5.0-6.0	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
LiB, LiD Lily	B	None	---	---	>6.0	---	---	20-40	Hard	Moderate	High.
LnB Lonewood	B	None	---	---	>6.0	---	---	40-72	Hard	Low	Moderate.
Lo Lobelville	C	Occasional	Very brief	Dec-Apr	2.0-3.0	Apparent	Dec-Apr	>60	---	High	Moderate.
MnB, MnD Minvale	B	None	---	---	>6.0	---	---	>60	---	Moderate	Low.
MoE Montevallo	D	None	---	---	>6.0	---	---	10-20	Soft	Moderate	Moderate.
Ne Newark	C	Occasional	Brief	Jan-Apr	0.5-1.5	Apparent	Dec-May	>60	---	High	Low.
NsB Nesbitt	B	None	---	---	2.0-4.0	Perched	Jan-Mar	>60	---	High	Moderate.
Pt*. Pits											
RaD Ramsey	D	None	---	---	>6.0	---	---	10-20	Hard	Low	Moderate.
RcF*: Ramsey	D	None	---	---	>6.0	---	---	10-20	Hard	Low	Moderate.
Rock outcrop.											

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
RoA---- Roane	C	Frequent----	Very brief	Jan-Apr	2.0-3.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
RoB---- Roane	C	Rare----	---	---	2.0-3.0	Perched	Jan-Apr	>60	---	Moderate	Moderate.
SeB---- Sequatchie	B	Rare----	---	---	>6.0	---	---	>60	---	Low----	Moderate.
SfB*: Sequatchie----	B	None----	---	---	>6.0	---	---	>60	---	Low----	Moderate.
Urban land.											
SmD---- Sequoia	C	None----	---	---	>6.0	---	---	20-40	Soft	High----	Moderate.
Sn---- Sewanee Variant	B	Occasional	Very brief	Dec-Apr	1.0-2.0	Apparent	Dec-Apr	20-40	Hard	Moderate	Moderate.
St---- Staser	B	Occasional	Very brief	Dec-Mar	3.0-4.0	Apparent	Dec-Mar	>60	---	Low----	Low.
TaC, TaD---- Talbott	C	None----	---	---	>6.0	---	---	20-40	Hard	High----	Moderate.
TrD*: Talbott----	C	None----	---	---	>6.0	---	---	20-40	Hard	High----	Moderate.
Rock outcrop.											
Tu---- Tupelo	D	Occasional	Brief----	Dec-Mar	1.0-2.0	Apparent	Nov-Mar	40-70	Hard	High----	Moderate.
UPF*: Udorthents.											
Pits.											
Ur*. Urban land											
WaB, WaD---- Waynesboro	B	None----	---	---	>6.0	---	---	>60	---	High----	High.
WeB---- Welchland	B	Rare----	---	---	>6.0	---	---	>60	---	Low----	Moderate.
Wh---- Whitwell	C	Occasional	Very brief	Dec-Mar	2.0-3.0	Apparent	Dec-Mar	>60	---	Moderate	Moderate.
Wo---- Woodmont	C	None----	---	---	1.0-2.0	Perched	Dec-Mar	>60	---	High----	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Allen	Fine-loamy, siliceous, thermic Typic Paleudults
Apison	Fine-loamy, siliceous, thermic Typic Hapludults
Armuchee	Clayey, mixed, thermic Ochreptic Hapludults
Barfield	Clayey, mixed, thermic Lithic Hapludolls
Bodine	Loamy-skeletal, siliceous, thermic Typic Paleudults
Bouldin	Loamy-skeletal, siliceous, mesic Typic Paleudults
Capshaw	Fine, mixed, thermic Ultic Hapludalfs
Colbert	Very-fine, montmorillonitic, thermic Vertic Hapludalfs
Collegedale	Clayey, mixed, thermic Typic Paleudults
Crossville	Fine-loamy, siliceous, mesic Umbric Dystrochrepts
Dewey	Clayey, kaolinitic, thermic Typic Paleudults
Dunning*	Fine, mixed, mesic Fluvaquentic Haplaquolls
Emory	Fine-silty, siliceous, thermic Fluventic Umbric Dystrochrepts
Enders	Clayey, mixed, thermic Typic Hapludults
Ennis	Fine-loamy, siliceous, thermic Fluventic Dystrochrepts
Etowah	Fine-loamy, siliceous, thermic Typic Paleudults
Fullerton	Clayey, kaolinitic, thermic Typic Paleudults
Gilpin	Fine-loamy, mixed, mesic Typic Hapludults
Guthrie	Fine-silty, siliceous, thermic Typic Fragiaquults
Hamblen	Fine-loamy, siliceous, thermic Fluvaquentic Eutrochrepts
Hanceville	Clayey, mixed, thermic Typic Rhodudults
Holston	Fine-loamy, siliceous, thermic Typic Paleudults
Humphreys	Fine-loamy, siliceous, thermic Humic Hapludults
Lily	Fine-loamy, siliceous, mesic Typic Hapludults
Lobelville	Fine-loamy, siliceous, thermic Fluvaquentic Dystrochrepts
Lonewood	Fine-loamy, siliceous, mesic Typic Hapludults
Minvale	Fine-loamy, siliceous, thermic Typic Paleudults
Montevallo	Loamy-skeletal, mixed, thermic, shallow Typic Dystrochrepts
Nesbitt*	Fine-silty, siliceous, thermic Aquic Paleudalfs
Newark*	Fine-silty, mixed, nonacid, mesic Aeric Fluvaquents
Ramsey	Loamy, siliceous, mesic Lithic Dystrochrepts
Roane	Fine-loamy, siliceous, thermic Glossic Fragiudults
Sequatchie	Fine-loamy, siliceous, thermic Humic Hapludults
Sequoia	Clayey, mixed, mesic Typic Hapludults
Sewanee Variant	Fine-loamy, siliceous, mesic Fluvaquentic Dystrochrepts
Shack	Fine-loamy, siliceous, thermic Fragic Paleudults
Staser	Fine-loamy, mixed, thermic Cumulic Hapludolls
Talbott	Fine, mixed, thermic Typic Hapludalfs
Tupelo	Fine, mixed, thermic Aquic Hapludalfs
Waynesboro	Clayey, kaolinitic, thermic Typic Paleudults
Welchland	Coarse-loamy, siliceous, mesic Humic Hapludults
Whitwell	Fine-loamy, siliceous, thermic Aquic Hapludults
Woodmont	Fine-silty, siliceous, thermic Glossaquic Fragiudalfs

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

* U.S. GOVERNMENT PRINTING OFFICE: 1982-355-099/1117

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LEGEND [1/]

1	FULLERTON-BODINE: Gently sloping to steep, well drained and somewhat excessively drained cherty soils that are more than 5 feet deep over limestone; on high hills and ridges
2	COLBERT-TALBOTT: Gently sloping to moderately steep, moderately well drained and well drained loamy soils that have a clayey subsoil and depth of 5 feet or less over limestone; on uplands
3	LILY-LONEWOOD-RAMSEY: Gently sloping to steep, well drained loamy soils that are less than 6 feet deep over sandstone and shale; on the cumberland Plateau
4	BOULDIN-GILPIN-ALLEN: Gently sloping to steep, well drained loamy soils that range from 2 feet to more than 5 feet deep over sandstone, shale, and limestone; on mountainsides and foot slopes
5	MONTEVALLO-HANCEVILLE: Moderately steep and steep, well drained loamy soils that range from less than 20 inches to more than 5 feet deep over sandstone and shale; on mountains and ridges
6	ARMUCHEE-ENDERS-APISON: Gently sloping to steep, well drained loamy soils that have a clayey and loamy subsoil and are less than 5 feet deep to shale bedrock; on rolling hills and ridges
7	RAMSEY-ROCK OUTCROP-LILY: Gently sloping to steep, well drained loamy soils that are less than 4 feet deep over sandstone bedrock and Rock outcrop; on the Cumberland Plateau

[1/] Texture terms refer to the surface layer of the major soils.

Compiled 1981

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
TENNESSEE AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

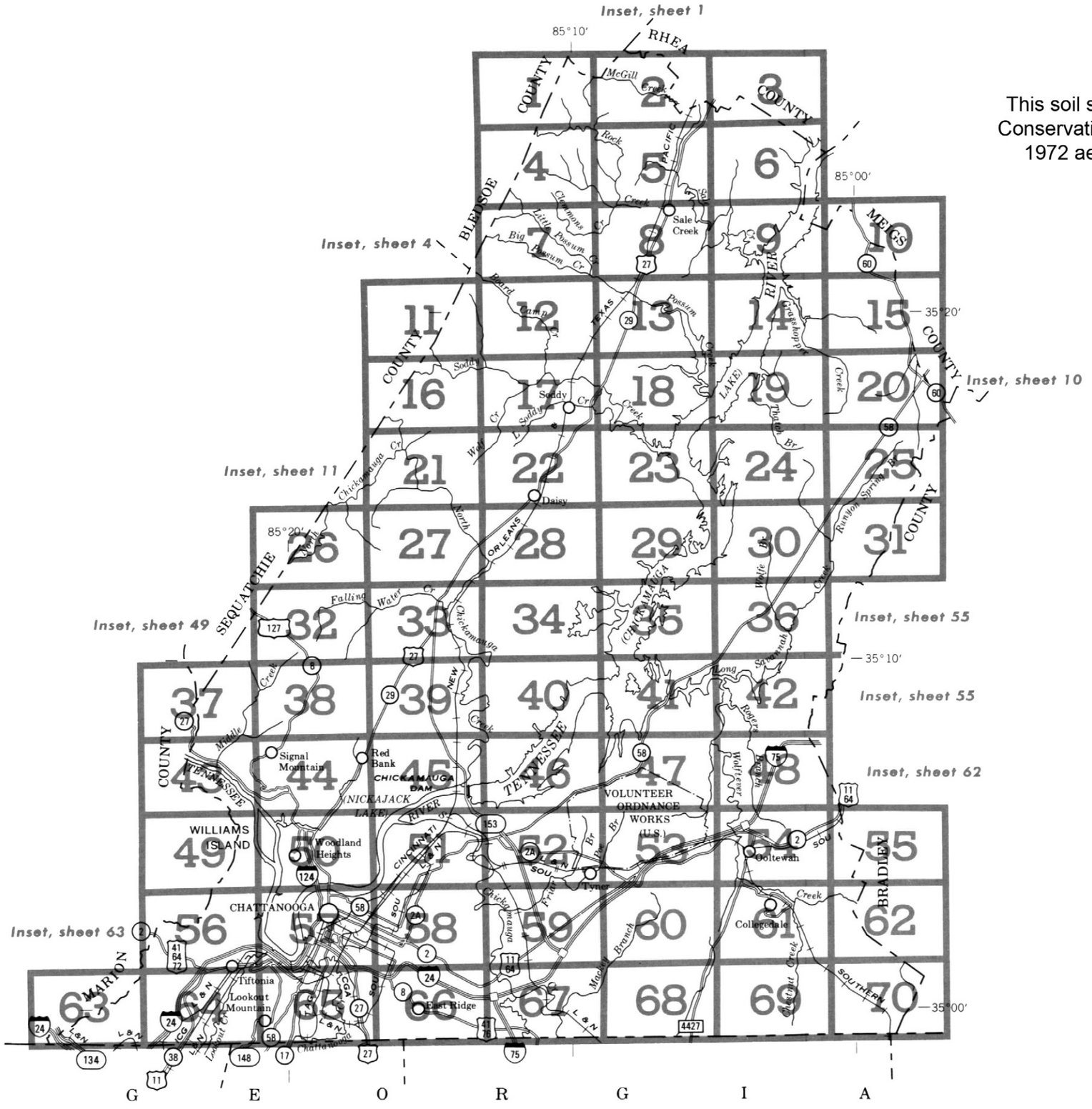
HAMILTON COUNTY, TENNESSEE

N

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km



Original text from each individual map sheet read:
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1972 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEX TO MAP SHEETS

HAMILTON COUNTY, TENNESSEE

Scale 1:253,440

1 0 1 2 3 4 Miles

1 0 4 8 Km

N

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline
- AD HOC BOUNDARY (label) — Hedley Airstrip
- Small airport, airfield, park, oilfield, cemetery, or flood pool — FLOOD POOL LINE

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 71
- Federal — 173
- State — 28
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small — water, w

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) — Indian Mound
- Located object (label) — Tower
- Tank (label) — Gas
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) — CANAL
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial — water, w
- Intermittent — int, i

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — AeD / RcF

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

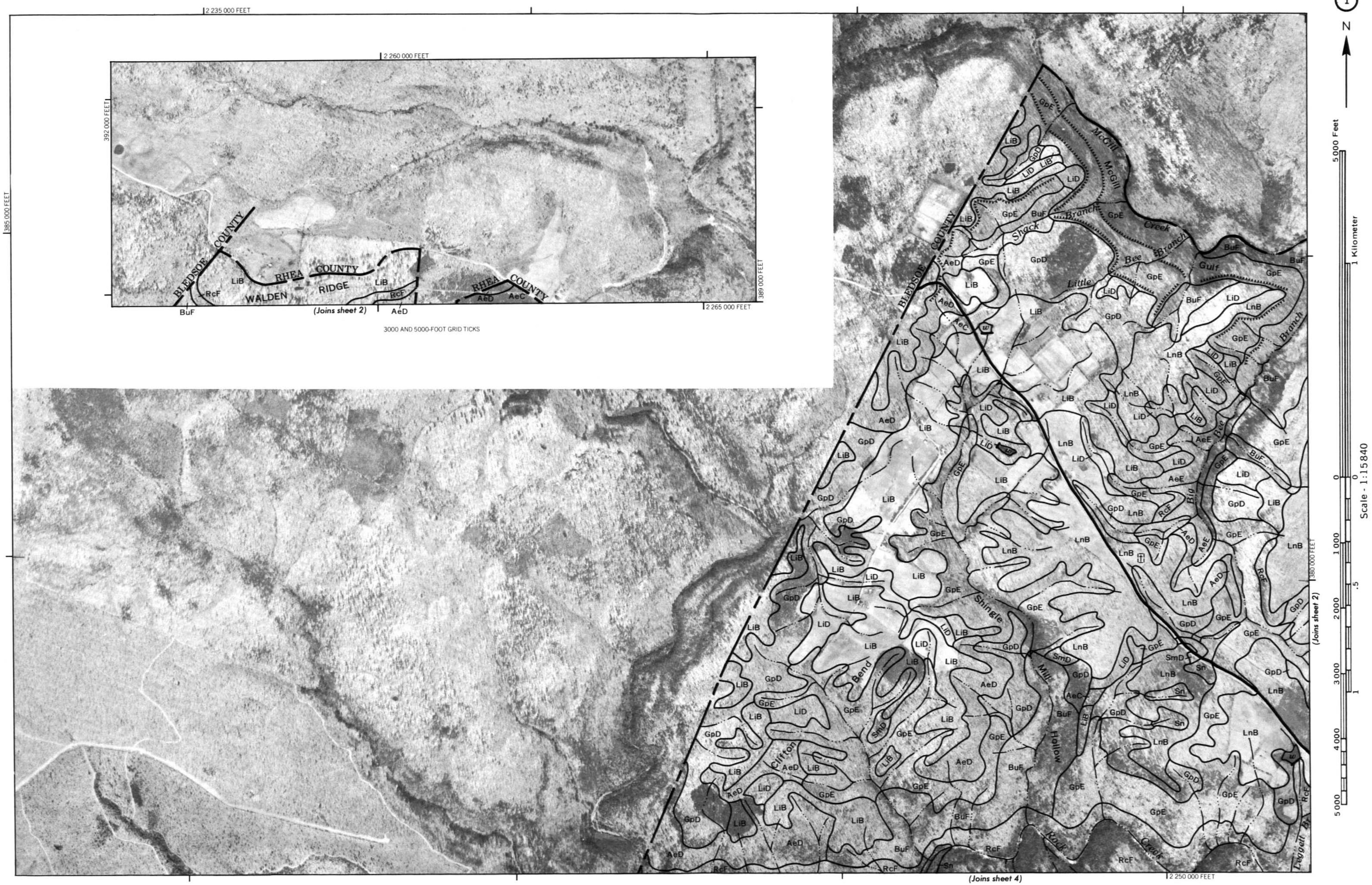
MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

SOIL LEGEND

The first letter, always a capital, is the initial letter of the soil name. The second letter is a capital only if the mapping unit is broadly defined; otherwise, it is a small letter. The third letter, if used, is always a capital and shows the slope. Symbols without slope letters are those of nearly level slopes or miscellaneous areas.

SYMBOL	NAME
AeC	Allen loam, 3 to 12 percent slopes
AeD	Allen loam, 12 to 25 percent slopes
AeE	Allen loam, 25 to 40 percent slopes
ApC	Apison loam, 5 to 15 percent slopes
ArB	Arents, gently sloping
AuD	Armuchee silt loam, 10 to 25 percent slopes
AuE	Armuchee silt loam, 25 to 40 percent slopes
BaE	Barfield-Rock outcrop complex, 10 to 40 percent slopes
BoC	Bodine cherty silt loam, 5 to 12 percent slopes
BoD	Bodine cherty silt loam, 12 to 25 percent slopes
BoE	Bodine cherty silt loam, 25 to 45 percent slopes
BsD	Bodine-Shack complex, 5 to 25 percent slopes
BuF	Bouldin-Gilpin complex, 20 to 60 percent slopes
CaB	Capshaw silt loam, 2 to 6 percent slopes
CbC	Colbert silt loam, 2 to 12 percent slopes
CcD	Colbert-Rock outcrop complex, 5 to 20 percent slopes
CdC	Colbert-Urban land complex, 2 to 12 percent slopes
CoC	Collegedale silt loam, 2 to 12 percent slopes
CoD	Collegedale silt loam, 12 to 25 percent slopes
CrB	Crossville loam, 2 to 5 percent slopes
DeB	Dewey silt loam, 2 to 6 percent slopes
DeD	Dewey silt loam, 12 to 25 percent slopes
Du	Dunning silty clay loam
Ec	Emory silt loam
EdC	Enders silt loam, 2 to 12 percent slopes
EeD	Enders silty clay loam, 12 to 25 percent slopes, eroded
EgC	Enders gravelly loam, 2 to 12 percent slopes
EhC	Enders-Urban land complex, 2 to 12 percent slopes
En	Ennis cherty silt loam
EtB	Etowah silt loam, 2 to 5 percent slopes
EtD	Etowah silt loam, 12 to 20 percent slopes
FuB	Fullerton cherty silt loam, 3 to 7 percent slopes
FuD	Fullerton cherty silt loam, 12 to 25 percent slopes
FuE	Fullerton cherty silt loam, 25 to 40 percent slopes
FwD	Fullerton-Urban land complex, 3 to 40 percent slopes
GpD	Gilpin silt loam, 12 to 25 percent slopes
GpE	Gilpin silt loam, 25 to 40 percent slopes
Gu	Guthrie silt loam
Ha	Hamblen silt loam
HcD	Hanceville loam, 12 to 25 percent slopes
HcE	Hanceville loam, 25 to 40 percent slopes
HoB	Holston loam, 2 to 6 percent slopes
HoD	Holston loam, 10 to 20 percent slopes
HuB	Humphreys cherty silt loam, 1 to 6 percent slopes
LiB	Lily loam, 2 to 7 percent slopes
LiD	Lily loam, 12 to 20 percent slopes
Lo	Lobelville cherty silt loam
LnB	Lonewood silt loam, 2 to 6 percent slopes
MnB	Minvale cherty silt loam, 3 to 12 percent slopes
MnD	Minvale cherty silt loam, 12 to 20 percent slopes
MoE	Montevallo shaly silt loam, 20 to 45 percent slopes
Ne	Newark silt loam
NsB	Nesbitt silt loam, 2 to 6 percent slopes
Pt	Pits, quarries
RaD	Ramsey loam, 8 to 25 percent slopes
RcF	Ramsey-Rock outcrop complex, 15 to 70 percent slopes
RoA	Roane cherty loam, 0 to 2 percent slopes
RoB	Roane cherty silt loam, 2 to 6 percent slopes
SeB	Sequatchie loam, 2 to 7 percent slopes
SfB	Sequatchie-Urban land complex, 2 to 7 percent slopes
SmD	Sequoia silt loam, 8 to 20 percent slopes
Sn	Sewanee Variant silt loam
St	Staser loam
TaC	Talbott silt loam, 2 to 12 percent slopes
TaD	Talbott silt loam, 12 to 25 percent slopes
TrD	Talbott-Rock outcrop complex, 5 to 25 percent slopes
Tu	Tupelo silt loam
UPF	Udorthents and Pits, steep
Ur	Urban land
WaB	Waynesboro loam, 2 to 8 percent slopes
WaD	Waynesboro loam, 12 to 25 percent slopes
WeB	Welchland cobbly loam, 2 to 7 percent slopes
Wh	Whitwell loam
Wo	Woodmont silt loam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N
2 235 000 FEET
2 260 000 FEET
392 000 FEET
385 000 FEET
389 000 FEET
2 265 000 FEET
380 000 FEET
2 250 000 FEET
BLEDSOE COUNTY
RHEA COUNTY
WALDEN RIDGE
(Joins sheet 2)
3000 AND 5000-FOOT GRID TICKS
McGill Creek
McGill Branch
Shack Branch
Little Bee Branch
Gulf Branch
Big Bee
Shingle Mill Hollow
Clifton Bend
Rock Creek
Leggett Br.
(Joins sheet 2)
(Joins sheet 4)
5000 Feet
1 Kilometer
Scale - 1:15840


2
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(Joins inset, sheet 1)
2 270 000 FEET
385 000 FEET
380 000 FEET
2 255 000 FEET
(Joins sheet 5)
(Joins sheet 3)
(Joins sheet 1)
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4 000
5 000
1 Kilometer
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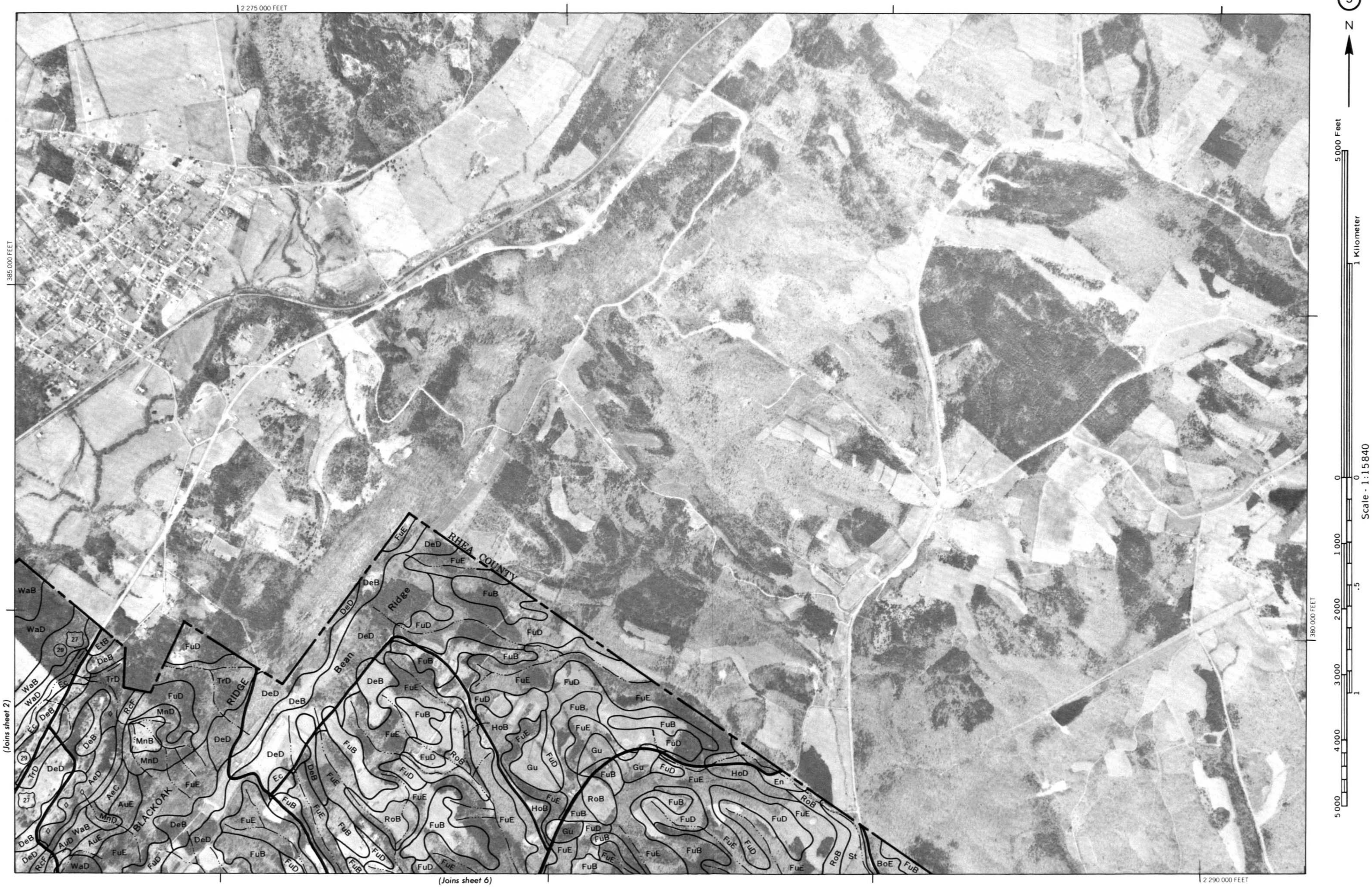
1
BLEDSOE COUNTY
RHEA CO
RHEA COUNTY
WALDEN RIDGE
Burton RIDGE
WALDEN
CUMBERLAND
ESCARPMENT
Flora Branch
McGill Creek
Big Bee Branch
Gulf
Sulphur Springs Hollow
Hart Potebridge Gulf Branch
Rattlesnake Hollow
Hollow
Leggett Br
Rocky Br
Flat Br
Sale Creek
SOUTHERN
29


3
N
2 275 000 FEET
385 000 FEET
380 000 FEET
2 290 000 FEET
(Joins sheet 2)
(Joins sheet 6)
RHEA COUNTY
Bean Ridge
BLACKOAK RIDGE
WaB
WaD
FtB
DeB
TrD
Ec
FuD
FuE
FuB
DeD
MnD
MnB
RcF
AeD
AeC
AuE
AuD
HoB
HoD
Gu
RoB
En
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5000 Feet
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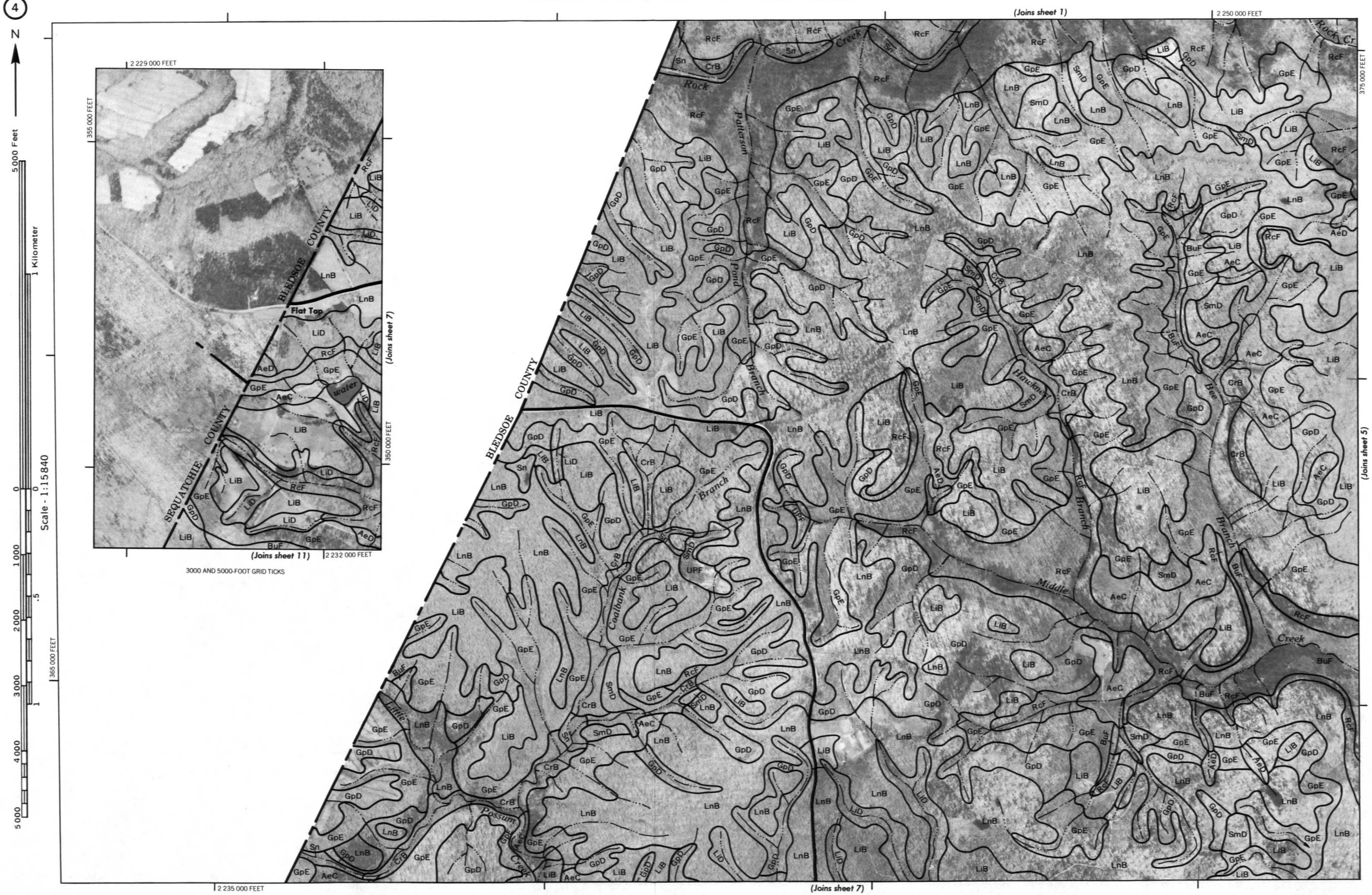
4000
5000
.5
1
Scale - 1:15840


4
N
5 000 Feet
1 Kilometer
Scale - 1:15840
(Joins sheet 1)
2 250 000 FEET
375 000 FEET
(Joins sheet 5)
(Joins sheet 7)
2 235 000 FEET
365 000 FEET
2 229 000 FEET
355 000 FEET
350 000 FEET
2 232 000 FEET
(Joins sheet 11)
3000 AND 5000-FOOT GRID TICKS
BLEDSOE COUNTY
SEQUATCHIE COUNTY
Flat Top
water
Rock Creek
Patterson Branch
Pond Branch
Hawkins Branch
Bee Branch
Middle Creek
Coalbank Branch
Little Possum Creek
Rock Cr


5
N
(Joins sheet 2)
(Joins sheet 4)
(Joins sheet 6)
(Joins sheet 8)
2 255 000 FEET
2 270 000 FEET
375 000 FEET
365 000 FEET
5 000 Feet
1 Kilometer
Scale - 1:15840
CUMBERLAND
ESCARPMENT
ELSEA
RIDGE
BLACKOAK
Coulterville
SOUTHERN
Rock Creek
Flat Branch
Spring Hollow
Boiling
Rocky Branch
Thomas
Yarnell
Point
Middle Creek
Sale Creek
SALE CREEK
Hodgetown Branch
Rock
27
29

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 6

6

N

5000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 5)

(Joins sheet 3)

(Joins sheet 9)

2 290 000 FEET

375 000 FEET

365 000 FEET

2 275 000 FEET

BLACKOAK RIDGE

Aslinger Hollow

Hinkle Hollow

Shipley Hollow

Lake Drive

RHEA COUNTY

MEIGS COUNTY

CHICKAMAUGA LAKE

TENNESSEE RIVER

(Joins sheet 4)

2 235 000 FEET

360 000 FEET

BLEDSOE COUNTY

HUGHES

RIDGE

BAKEWELL

MOUNTAIN

Hughes Branch

Big Possum Creek

Little Possum Creek

Clemmons Creek

Stillhouse Br

Big Possum Creek

Bakewell Creek

Perkins Point

Bare Point

Board Camp Gulf

Barn Hill Gulf

Possum Creek

(Joins inset, sheet 4)

(Joins sheet 8)

(Joins sheet 12)

2 250 000 FEET

350 000 FEET

7

N

5000 Feet

1 Kilometer

Scale - 1:15840

5 000 4 000 3 000 2 000 1 000 0 0 .5 1


8
N
5 000 Feet
1 Kilometer
Scale - 1:15 840
0
1 000
2000
3000
4000
5 000
0
.5
1
(Joins sheet 5)
(Joins sheet 7)
(Joins sheet 9)
(Joins sheet 13)
2 270 000 FEET
360 000 FEET
350 000 FEET
2 255 000 FEET
Middle Creek
Rock Creek
Stillhouse Branch
Creek
Clemmons
BAKEWELL
ESCARPMENT
MOUNTAIN
CUMBERLAND
Skiles
Possum Creek
Bakewell Gulf
Branch
Sale Creek
SALE CREEK
CHICKAMAUGA LAKE
Branch
Hodgetown
Hodgetown
SOUTHERN
water
27
29

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 9

9

N

2 275 000 FEET

360 000 FEET

(Joins sheet 6)

(Joins sheet 8)

(Joins sheet 10)

(Joins sheet 14)

2 290 000 FEET

350 000 FEET

SALE CREEK

CHICKAMAUGA LAKE

TENNESSEE RIVER

Price Point

Lakewood

MEIGS COUNTY

Parker Bluff

Smith Hill

Joe

5 000 Feet

1 Kilometer

Scale - 1:15 840

10

N

5,000 Feet

1 Kilometer

Scale - 1:15840

2 310 000 FEET

360 000 FEET

330 000 FEET

325 000 FEET

350 000 FEET

2 295 000 FEET

2 317 000 FEET

2 313 000 FEET

MEIGS COUNTY

BRADLEY COUNTY

Hill

Smith

Joe

Branch

Birchwood

water

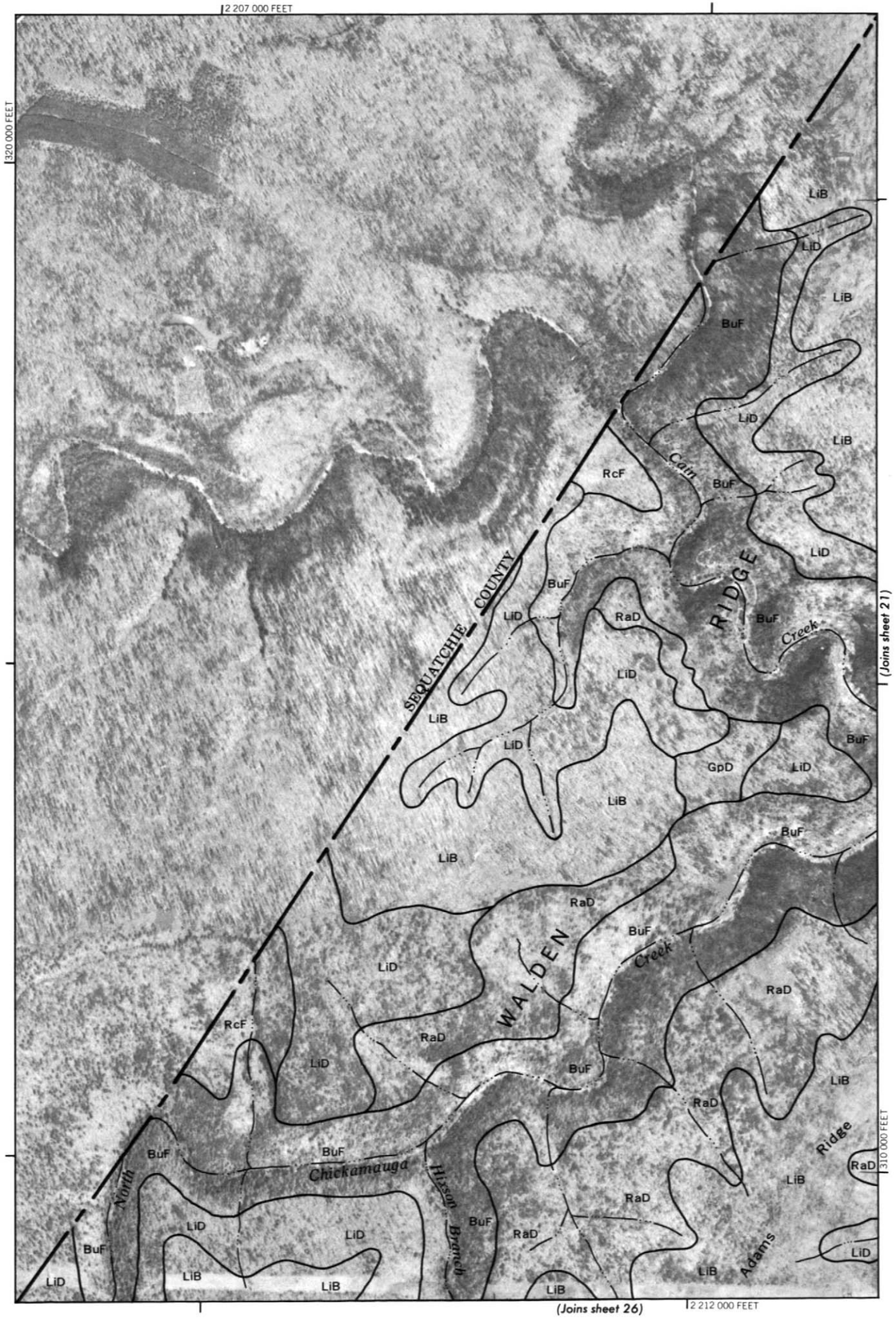
(Joins sheet 9)

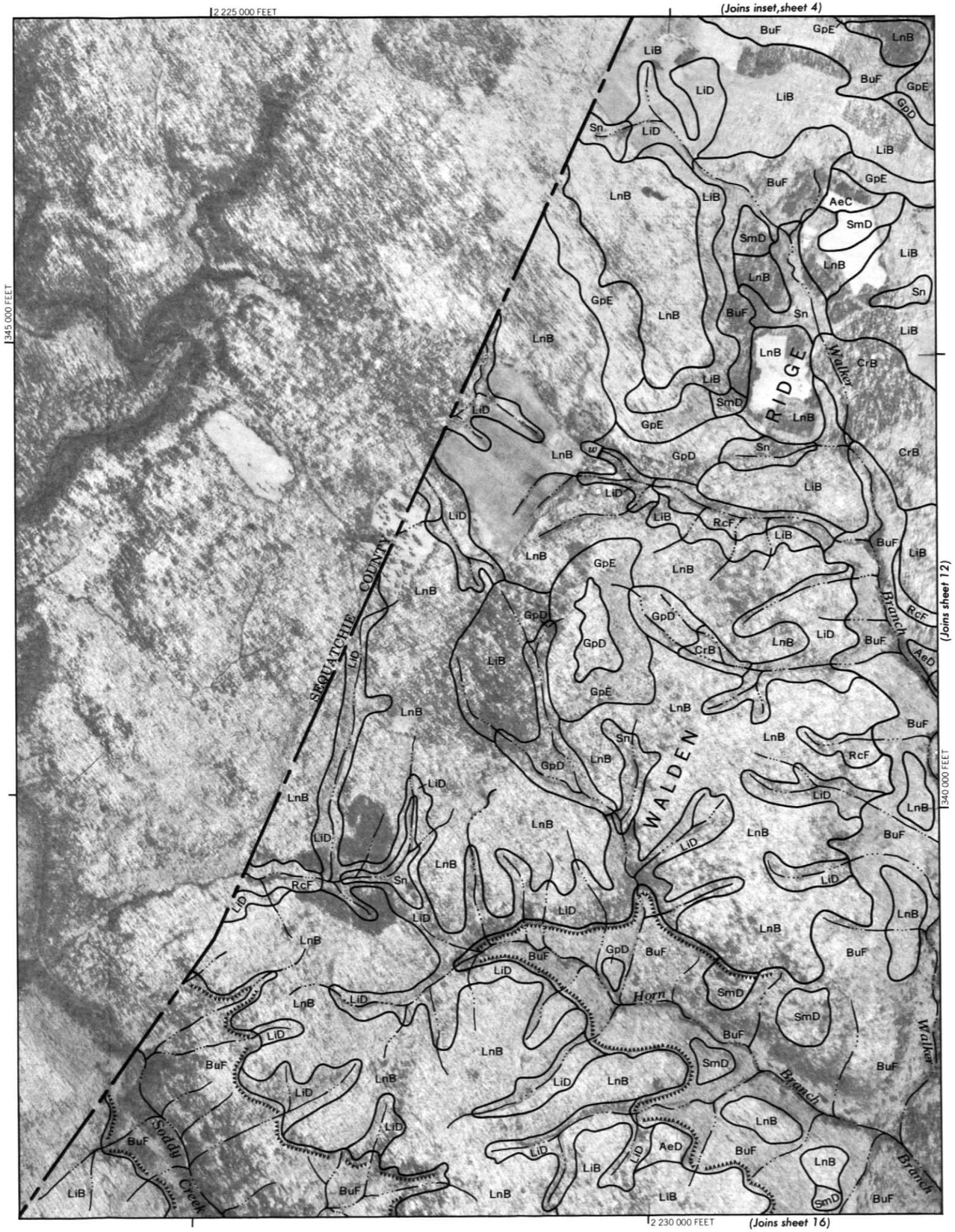
(Joins sheet 15)

(Joins sheet 20)

(Joins sheet 25)

4000 AND 5000-FOOT GRID TICKS





11

N

5 000 Feet

1 Kilometer

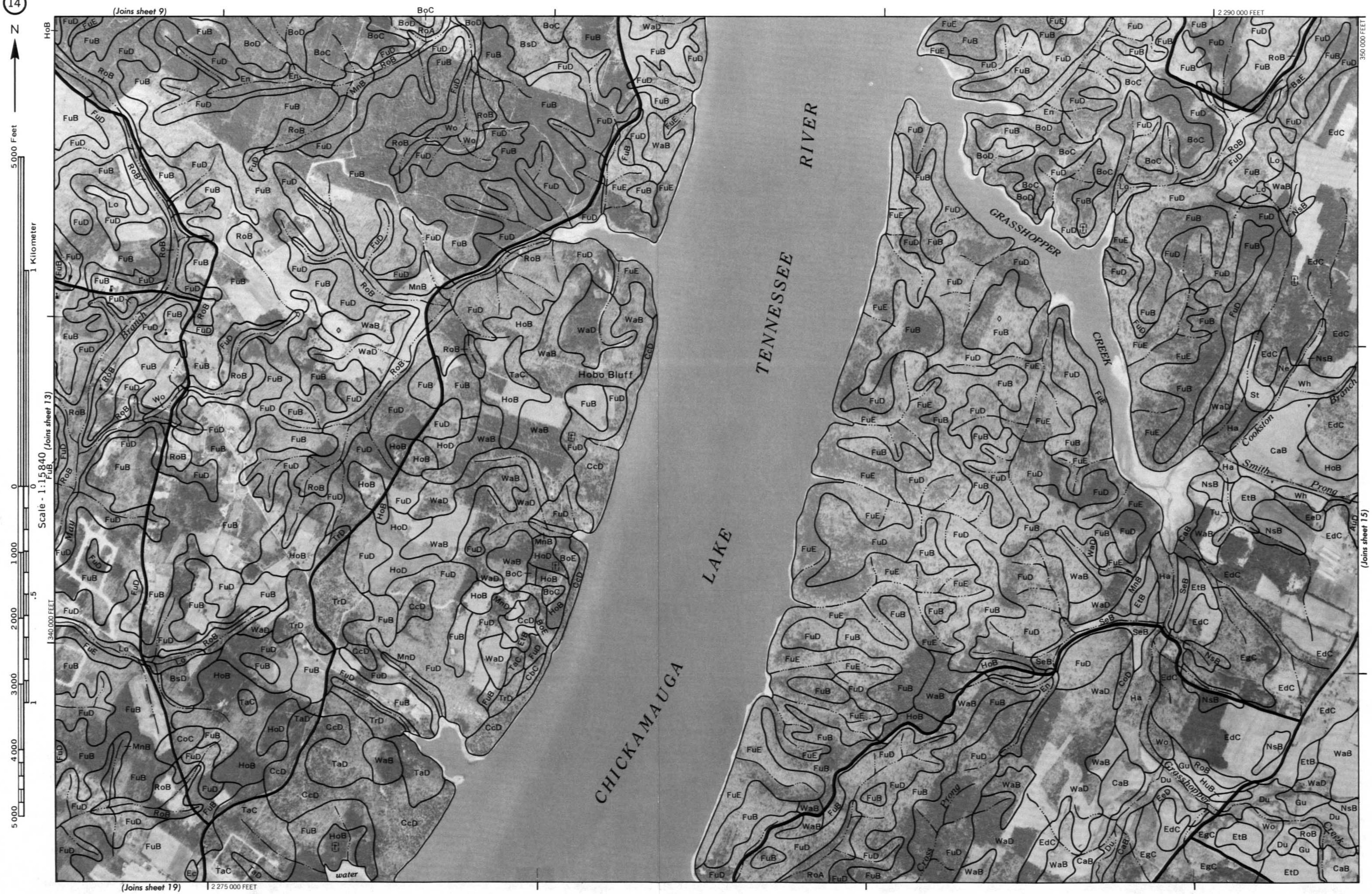
Scale - 1:15840

0 1 000 2 000 3 000 4 000 5 000

0 .5 1


N
(Joins sheet 7)
(Joins sheet 11)
(Joins sheet 13)
(Joins sheet 17)
2 250 000 FEET
2 235 000 FEET
345 000 FEET
340 000 FEET
5000 Feet
1 Kilometer
Scale - 1:15840
0
1000
2000
3000
4000
5000
.5
1
Board Camp Gulf
Barn Hill
RIDGE
Richey Ridge
WALDEN
Board
Camp
Creek
Branch
Buckhorn
ESCARPMENT
CUMBERLAND
Jones Gap
water
SOUTHERN


2 255 000 FEET
345 000 FEET
(Joins sheet 8)
HoB
(Joins sheet 14)
(Joins sheet 12)
(Joins sheet 18)
2 270 000 FEET
340 000 FEET
Possum Creek
Skiles Branch
Bakewell
SOUTHERN
Posey Hollow
POSSUM CREEK
CHICKAMAUGA LAKE
May Branch
water
13
N
5 000 Feet
1 Kilometer
Scale - 1:15 840
0
1 000
2 000
3 000
4 000
5 000
.5
1


14
N
(Joins sheet 9)
(Joins sheet 13)
(Joins sheet 15)
(Joins sheet 19)
2 290 000 FEET
350 000 FEET
340 000 FEET
2 275 000 FEET
Scale - 1:15840
5 000 Feet
1 Kilometer
TENNESSEE RIVER
CHICKAMAUGA LAKE
GRASSHOPPER CREEK
Hobo Bluff
Branch
Cookston Branch
Smith Prong
Cross Prong
Grasshopper Creek
water

(Joins sheet 10)

2 295 000 FEET

350 000 FEET

(Joins sheet 14)

(Joins sheet 20)

2 310 000 FEET

340 000 FEET

15

N

5,000 Feet

1 Kilometer

Scale - 1:15840

0 1000 2000 3000 4000 5000

0 .5 1

Cookston Branch

Penny Branch

Smith Branch

Anderson Branch

Spring Branch

MEIGS COUNTY

16

N

5000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 11)

2 230 000 FEET

335 000 FEET

(Joins sheet 17)

2 215 000 FEET

(Joins sheet 21)

325 000 FEET

SEQUATCHIE COUNTY

RIDGE

WALDEN

Mansfield

Redbird Point

Grant

Mowbray

Stevenson

Cooper

Gray

Soddy

Creek

Branch

water


17
N
2 235 000 FEET
(Joins sheet 12)
335 000 FEET
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 22)
2 250 000 FEET
325 000 FEET
Sims Neck
WALDEN
Ridge
Taylor
RIDGE
Cedar
Deep Creek
Soddy Creek
ESCARPMENT
Posey Point
Soddy
SODDY CREEK
CHICKAMAUGA LAKE
Clemmons Point
CUMBERLAND
5000 Feet
1 Kilometer
Scale - 1:15840

18

N

5 000 Feet

1 Kilometer

Scale - 1:15 840

(Joins sheet 13)

2 270 000 FEET

335 000 FEET

(Joins sheet 17)

(Joins sheet 19)

325 000 FEET

2 255 000 FEET (Joins sheet 23)

CHICKAMAUGA LAKE

SODDY CREEK

POSSUM CREEK

TENNESSEE RIVER

CHICKAMAUGA LAKE

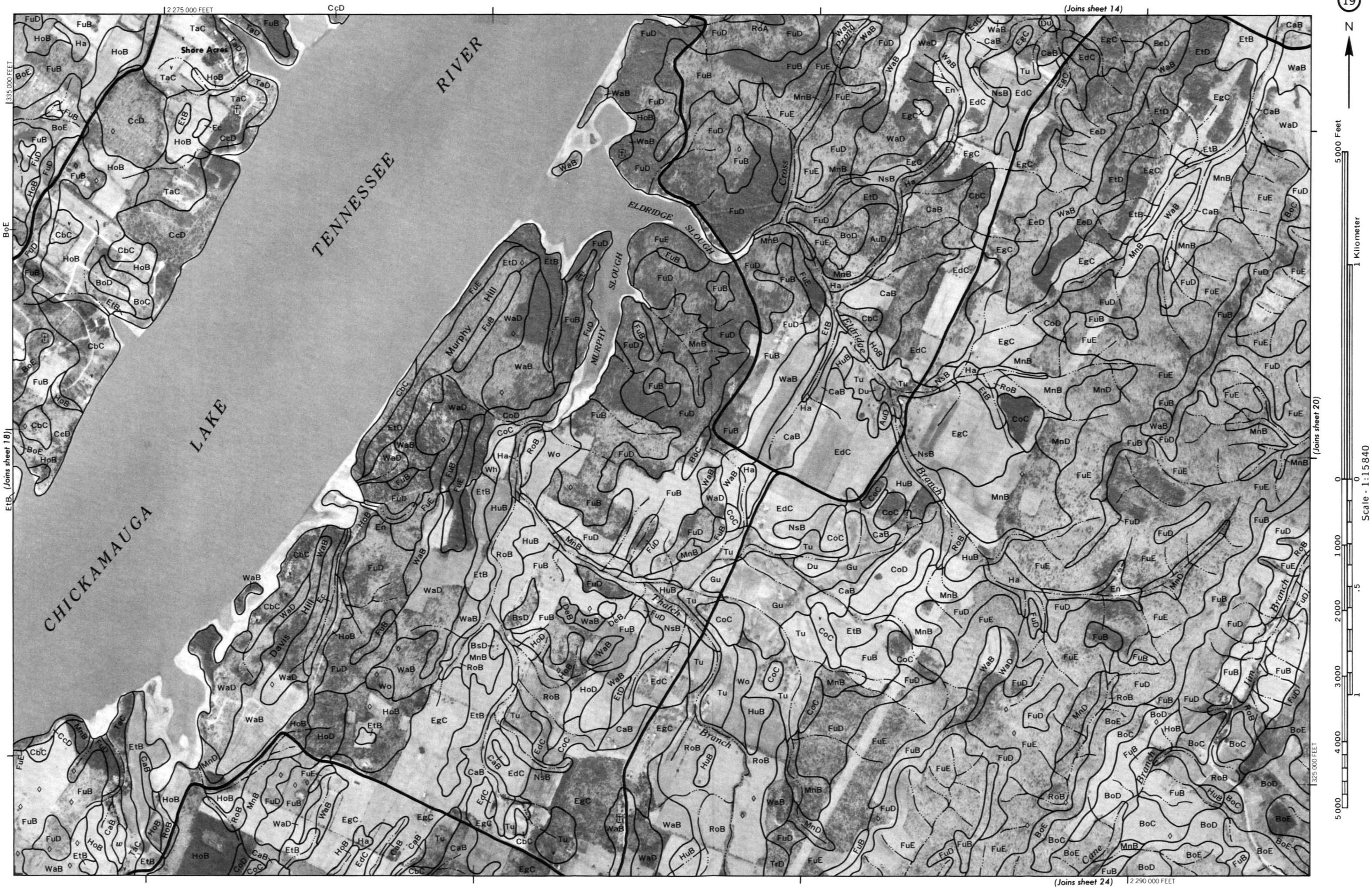
Opossum Creek Pines

Holly Heights

Soddy Lake Heights

Eldridge Branch

Possum Hollow



2 275 000 FEET
335 000 FEET
(Joins sheet 14)
(Joins sheet 18)
(Joins sheet 20)
(Joins sheet 24)
2 290 000 FEET
325 000 FEET
Shore Acres
TENNESSEE RIVER
CHICKAMAUGA LAKE
ELDRIDGE SLOUGH
MURPHY SLOUGH
Murphy Hill
Davis Hill
Cross
Pond
Eldridge
Branch
Thatch Branch
Jim Branch
Cane Branch
N
5000 Feet
1 Kilometer
Scale - 1:15840

20

N

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 19)

(Joins sheet 15)

2 310 000 FEET

335 000 FEET

(Joins inset, sheet 10)

2 295 000 FEET

325 000 FEET

(Joins sheet 25)

Grasshopper Creek

Wolf Pond

RIDGE

DIVIDING

Branch

Jim

Fork

West

MEIGS COUNTY

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 21


22
N
(Joins sheet 17)
(Joins sheet 21)
(Joins sheet 23)
(Joins sheet 28)
2 250 000 FEET
2 235 000 FEET
320 000 FEET
310 000 FEET
Scale 1:15840
5 000 Feet
1 Kilometer
0
1000
2000
3000
4000
5000
0
.5
1
Soddy-Daisy
Huckleberry
Crow Pond
Wolf Creek
Mikel Branch
Poe Branch
CUMBERLAND ESCARPMENT
Daisy
Oliver Hill
New Salem
SOUTHERN

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 23

23

N

2 255 000 FEET

320 000 FEET

(Joins sheet 18)

(Joins sheet 22)

(Joins sheet 24)

(Joins sheet 29)

310 000 FEET

2 270 000 FEET

CHICKAMAUGA LAKE

SODDY CREEK

CHICKAMAUGA TENNESSEE LAKE RIVER

Shady Grove

Maple Hollow

Shady Grove

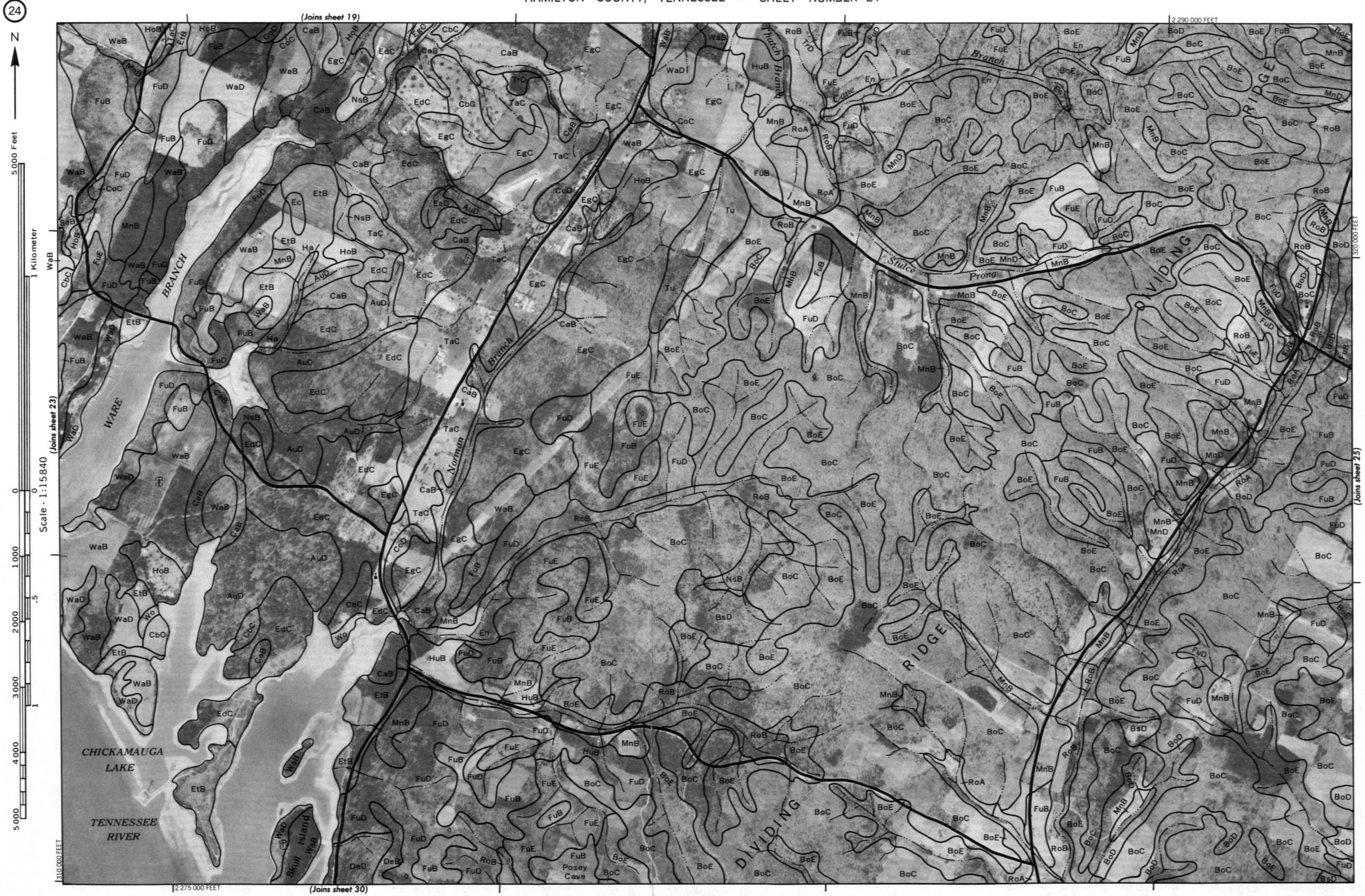
Grove Hollow

Ware Branch

5 000 Feet

1 Kilometer

Scale - 1:15840


24
N
(Joins sheet 19)
(Joins sheet 23)
(Joins sheet 25)
(Joins sheet 30)
2 290 000 FEET
2 275 000 FEET
320 000 FEET
310 000 FEET
5 000 Feet
1 Kilometer
Scale - 1:15 840
0
1000
2000
3000
4000
5000
0
.5
1
WARE
BRANCH
Norman
Branch
Thatch
Branch
Cane
Branch
Stulce
Prong
DIVIDING
RIDGE
CHICKAMAUGA
LAKE
TENNESSEE
RIVER
Skull Island
Posey
Cave

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 25

25

N

5,000 Feet

1 Kilometer

Scale - 1:15840

2 295 000 FEET

320 000 FEET

315 000 FEET

2 310 000 FEET

(Joins sheet 24)

(Joins sheet 20)

(Joins inset, sheet 10)

(Joins sheet 31)

MOUNTAIN

WHITEOAK MOUNTAIN

BRADLEY COUNTY

Branch

Creek

Spring

Taliaferro Gap

(Joins inset, sheet 11)

2 210 000 FEET

N

5,000 Feet

1 Kilometer

Scale - 1:15840

300 000 FEET

305 000 FEET

(Joins sheet 27)

2 195 000 FEET

(Joins sheet 32)

SEQUATCHIE COUNTY

RIDGE

WALDEN

Holly Branch

Wolfpen Point

Seed Tick Branch

Chickamauga Creek

North Branch

Hurricane Branch

Hicks Branch

The Hellcan

Hixson Ridge

Adams Branch

Buck Knob

LiB LiD RaD RcF BuF GpE GpD LnB AeC AeD CrB UPF


27
N
2 215 000 FEET
(Joins sheet 21)
(Joins sheet 26)
(Joins sheet 28)
(Joins sheet 33)
305 000 FEET
300 000 FEET
2 230 000 FEET
Hixson Camp
Roberts Gap
Mile Straight
Falling Water
WALDEN RIDGE
CUMBERLAND ESCARPMENT
WALDEN RIDGE
North Chickamauga Creek
Chickamauga Gulch
North Chickamauga Creek
Barker Ridge
Muddy Br
Rogers Cr
Bull Br
Bend
Flipper Bend
Cleat Branch
Roberts Mill
Mill Branch
Rocky Branch
SOUTHERN
27
5000 Feet
1 Kilometer
Scale - 1:15840
0
1000
2000
3000
4000
5000
.5
1

28

N

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 22)

(Joins sheet 27)

(Joins sheet 34)

(Joins sheet 29)

2 250 000 FEET

305 000 FEET

300 000 FEET

2 235 000 FEET

Soddy-Daisy

Springfield Pond

Melville

Dallas

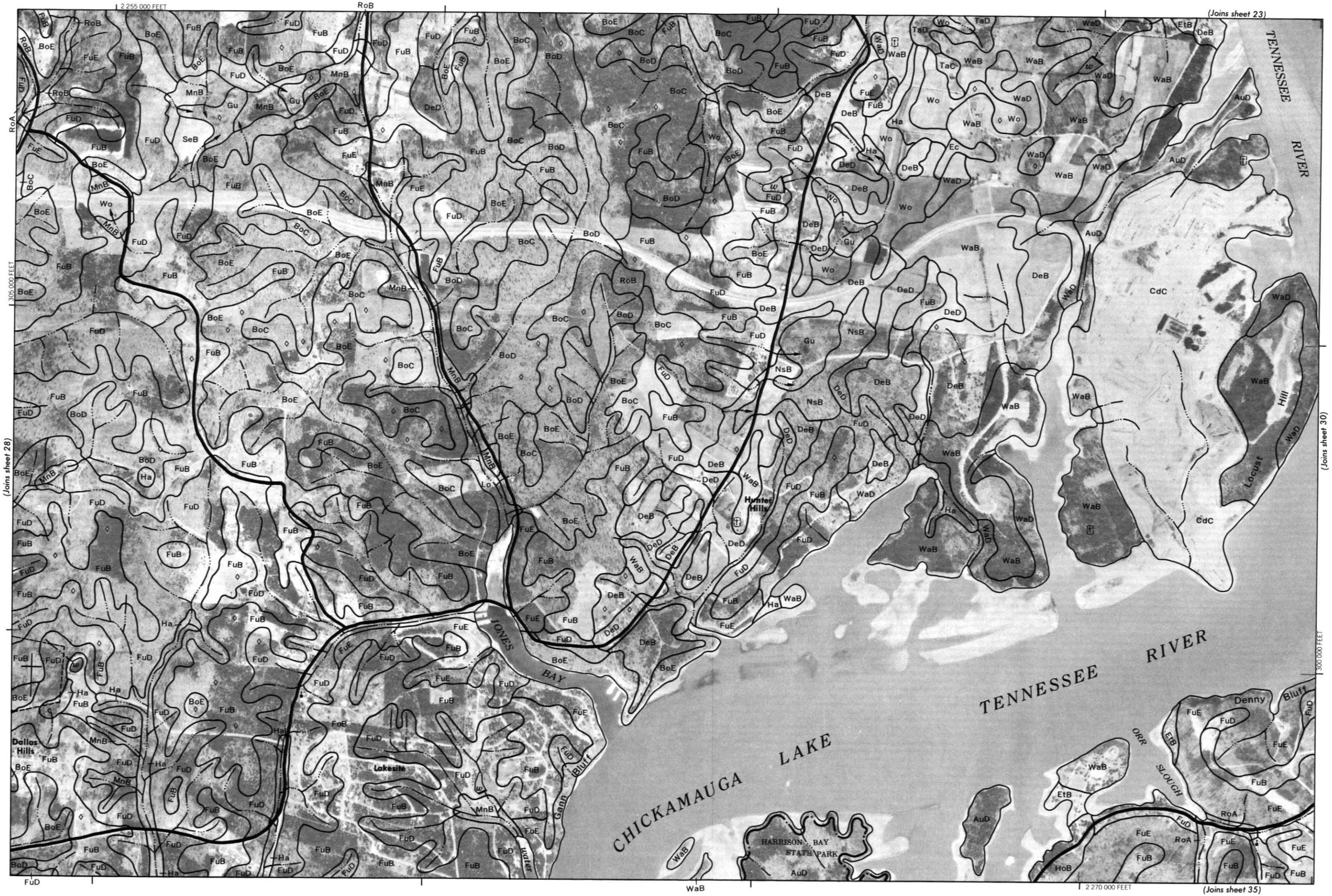
Dallas Gardens

Hollow

Branch

SOUTHERN

Poe



29

N

5,000 Feet

1 Kilometer

Scale - 1:15840

30

N

5 000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 24)

(Joins sheet 29)

(Joins sheet 31)

(Joins sheet 36)

2 290 000 FEET

310 000 FEET

300 000 FEET

2 275 000 FEET

RIVER

TENNESSEE

LAKE

CHICKAMAUGA

DIVIDING RIDGE

Skull Island

Moon Curve

Blue Spring

Chigger Point

Denny Bluff

Hollow

Sims

Davis Pond

water

(Joins sheet 25)

2 295 000 FEET

310 000 FEET

(Joins sheet 30)

(Joins inset B, sheet 55)

2 310 000 FEET

300 000 FEET

Lewis Branch

Squamish Creek

Long Creek

WHITEOAK MOUNTAIN

BRADLEY COUNTY

31

N

5,000 Feet

1 Kilometer

Scale - 1:15840

32

N

(Joins sheet 26)

2 210 000 FEET

295 000 FEET

SEQUATCHIE COUNTY

Hurricane Branch

Marshall Creek

Service Creek

Hatfield Branch

Conner Creek

Brown Branch

Studdenberg Creek

Fairmount

WALDEN RIDGE

Falling Water Creek

Pickett Creek

Falling Water Falls

Gulf Water

Levi Gap

Forest Park

Little Falling Water

ESCARPMENT

CUMBERLAND

Summertown

Dowler Heights

Chestnut Ridge

127

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins inset, sheet 49)

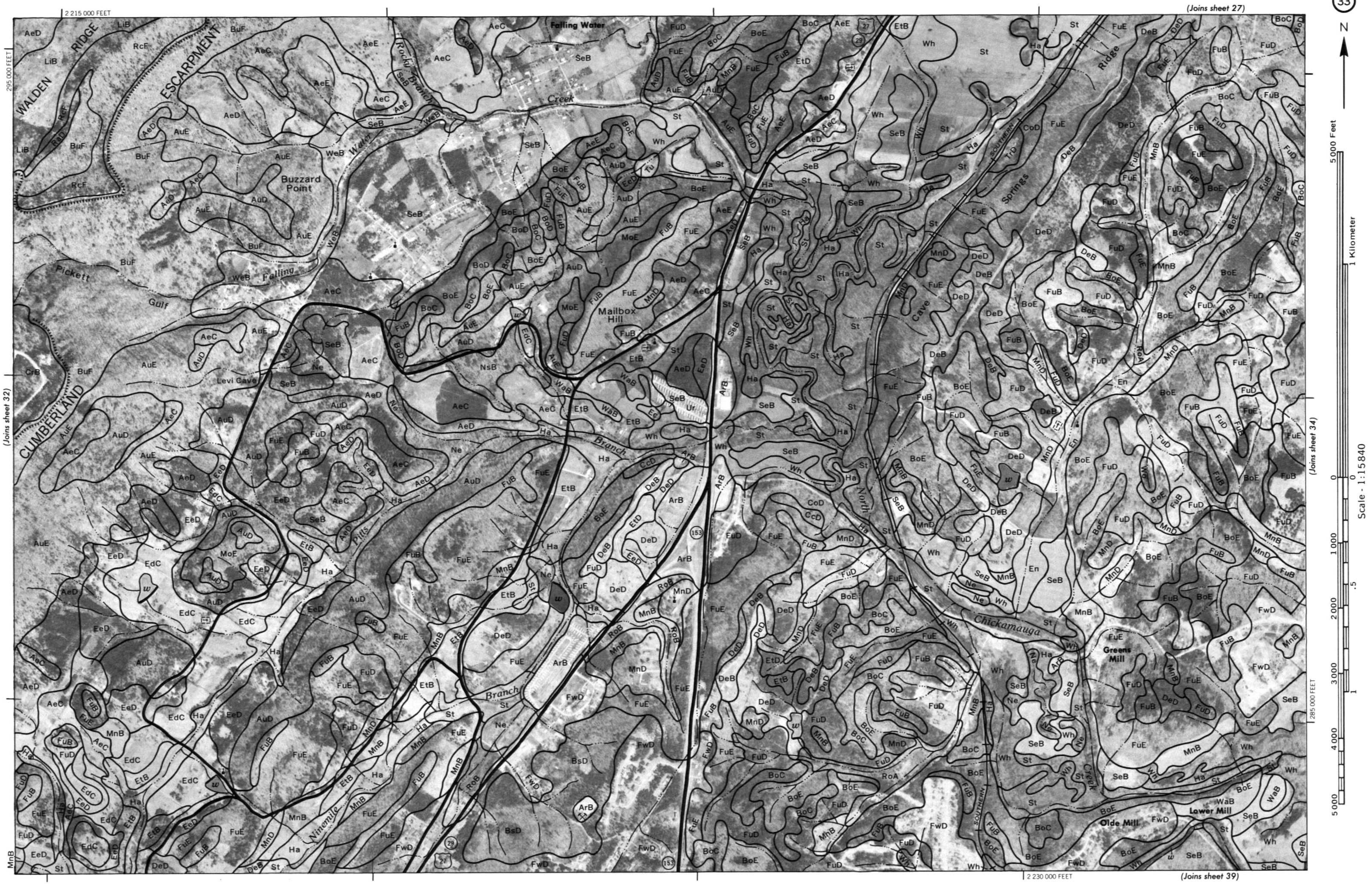
285 000 FEET

2 195 000 FEET

(Joins sheet 38)

(Joins sheet 33)

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 33



(Joins sheet 28)

2 250 000 FEET

(Joins sheet 35)

N

5 000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 33)

285 000 FEET

2 235 000 FEET

(Joins sheet 40)

Finetree Estates

Middle Valley

Lakeside

AIRPORT

Branch

CHICKAMAUGA LAKE

DALLAS BAY

Port Serena

Sterling Park

Middle Valley Estates

Parkshore Estates

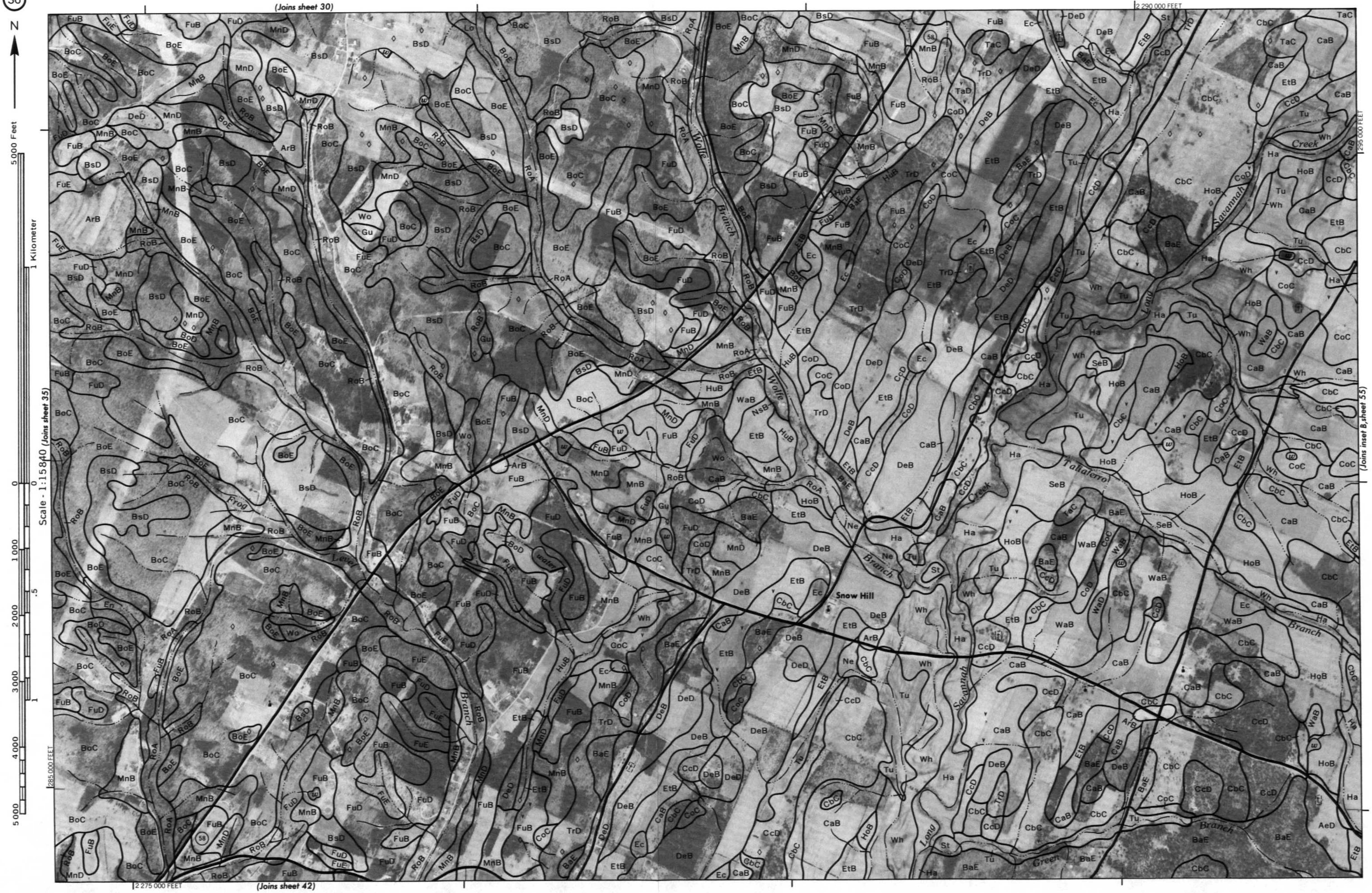
RIDGE

BIG

Bald Hill

Lick


35
N
(Joins sheet 29)
(Joins sheet 34)
(Joins sheet 36)
(Joins sheet 41)
2 255 000 FEET
295 000 FEET
285 000 FEET
2 270 000 FEET
CHICKAMAUGA LAKE
CHICKAMAUGA LAKE
TENNESSEE RIVER
DALLAS BAY
Dallas Island
Prairie Peninsula
Prairie Creek
Rocky Point
Point
Graveyard
HARRISON BAY STATE PARK
Morning Glory Lake
Shirley Pond
Ramsey Hollow
5000 Feet
1 Kilometer
Scale - 1:15840
0
1000
2000
3000
4000
5000
.5
1


36
N
(Joins sheet 30)
(Joins sheet 35)
(Joins inset B, sheet 55)
(Joins sheet 42)
2 290 000 FEET
295 000 FEET
285 000 FEET
2 275 000 FEET
5 000 Feet
1 Kilometer
Scale - 1:15 840
Snow Hill
Wolfe Branch
Frog Level Branch
Long Savannah Creek
Taliaferro Creek
Savannah Branch
Green Branch
Long Branch
58

(Joins inset, sheet 49)

2 175 000 FEET

280 000 FEET

SEQUATCHIE COUNTY

MARION COUNTY

Round Knob

Edwards Point

WALDEN RIDGE

Stanley Branch

Middle Creek

Short Creek

Suck Creek

Edwards Point

Middle Bee Branch

Timberlinks

(Joins sheet 38)

(Joins sheet 43)

270 000 FEET

2 195 000 FEET

37

N

5000 Feet

1 Kilometer

Scale - 1:15840

0 1000 2000 3000 4000 5000

0 .5 1


(Joins sheet 32)
(Joins sheet 37)
(Joins sheet 39)
(Joins sheet 44)
N
Scale - 1:15 840
5 000 Feet
1 Kilometer
2 210 000 FEET
280 000 FEET
270 000 FEET
2 195 000 FEET
CHATTANOOGA
(county seat)
RED BANK
WALDEN
Walden
Timesville
Skyline Park
Applewood
Shepherd Forest
Signal Mountain
Timberlinks
Ford Gap
RIDGE
CUMBERLAND
ESCARPMENT
Middle Creek
Short Creek
Bee Creek
Walden Branch
Shoal Creek
Mountain Creek
Creek

2 215 000 FEET

280 000 FEET

(Joins sheet 33)

(Joins sheet 38)

(Joins sheet 40)

(Joins sheet 45)

2 230 000 FEET

270 000 FEET

N

5,000 Feet

1 Kilometer

Scale - 1:15 840

CHATTANOOGA
(county seat)

Lake Forest

Towne Hills

Northern Hills

Hixson

Hamillville

HAMILTON MEMORIAL GARDENS

NORTH CHICKAMAUGA CREEK

Chickamauga Creek

Ninemile Branch

SOUTHERN

EeD EtB St DeD FuE DeB BoE FwD BoC FuB FuD Wh SeB Ha EtB DeB EdC Lo EtD MnB RoB TaC CaB CcD ObC CdC Tu SfB ArB HoB CbC Ec Wo Ne NsB MhB WaB Ur

40

N

(Joins sheet 34)

2 250 000 FEET

280 000 FEET

270 000 FEET

2 235 000 FEET

(Joins sheet 46)

(Joins sheet 39)

(Joins sheet 41)

5,000 Feet

1 Kilometer

Scale - 1:15840

0 1 000 2 000 3 000 4 000 5 000

0 .5 1

CHATTANOOGA
(county seat)

Valleybrook

Fairview

Harrison Bluff

Bald Hill

RIDGE

Branch

Rogers

BIG

TENNESSEE RIVER

CHICKAMAUGA LAKE

(41)

2 255 000 FEET

2 280 000 FEET

(Joins sheet 35)

(Joins sheet 40)

(Joins sheet 42)

2 275 000 FEET

2 270 000 FEET

(Joins sheet 47)

N

5 000 Feet

1 Kilometer

Scale - 1:15 840

TENNESSEE RIVER

CHICKAMAUGA LAKE

HARRISON BAY

WACONDA BAY

WOLFTEVER CREEK

HARRISON BAY STATE PARK

John A Patten Island

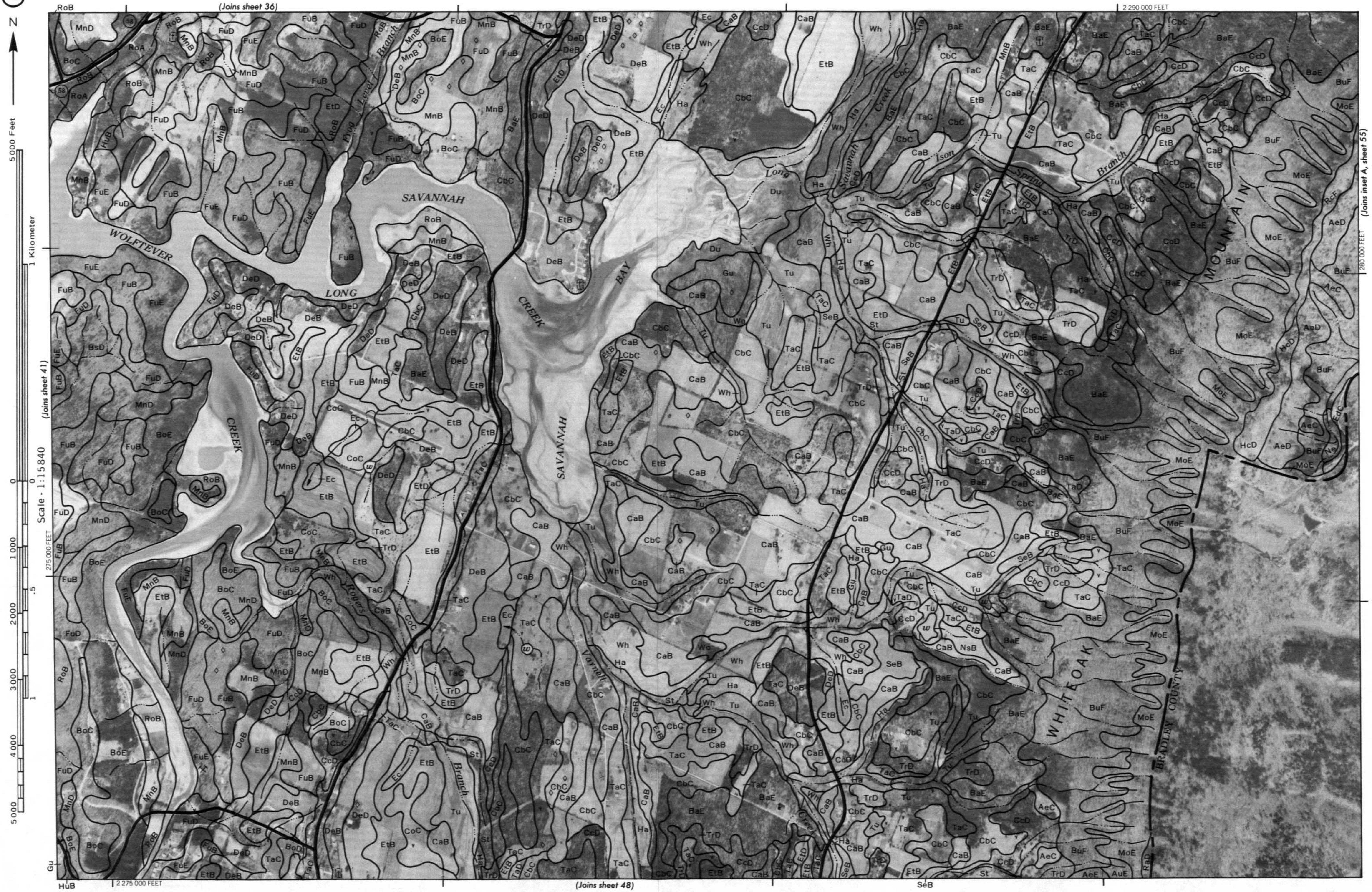
Pinkys Point

Waconda Point

Rabbit Island

Ramsey Hollow

water


N
(Joins sheet 36)
(Joins sheet 48)
(Joins sheet 41)
(Joins inset A, sheet 55)
2 290 000 FEET
2 275 000 FEET
275 000 FEET
280 000 FEET
5 000 Feet
1 Kilometer
Scale - 1:15840
WOLFTEVER
LONG
CREEK
SAVANNAH
BAY
Prog Level Branch
Ison Spring Branch
Rogers
Varnell
WHITE OAK
MOUNTAIN
BRADLEY COUNTY

2 180 000 FEET

265 000 FEET

(Joins sheet 37)

TENNESSEE RIVER

MARION COUNTY

RACCOON MOUNTAIN

NICKAJACK LAKE

Suck Creek

Middle Creek

Shoal Creek

RIDGE

WALDEN RIDGE

SIGNAL MOUNTAIN

Signal Point

Brady Point

James Point

Carriage Hill

Pitchfork Cave

Tumbling Shoals

Williams Island

BuF
RcF
LiB
RaD
GpD
SeB
St
SfB
AeD

260 000 FEET

(Joins sheet 49)

2 195 000 FEET

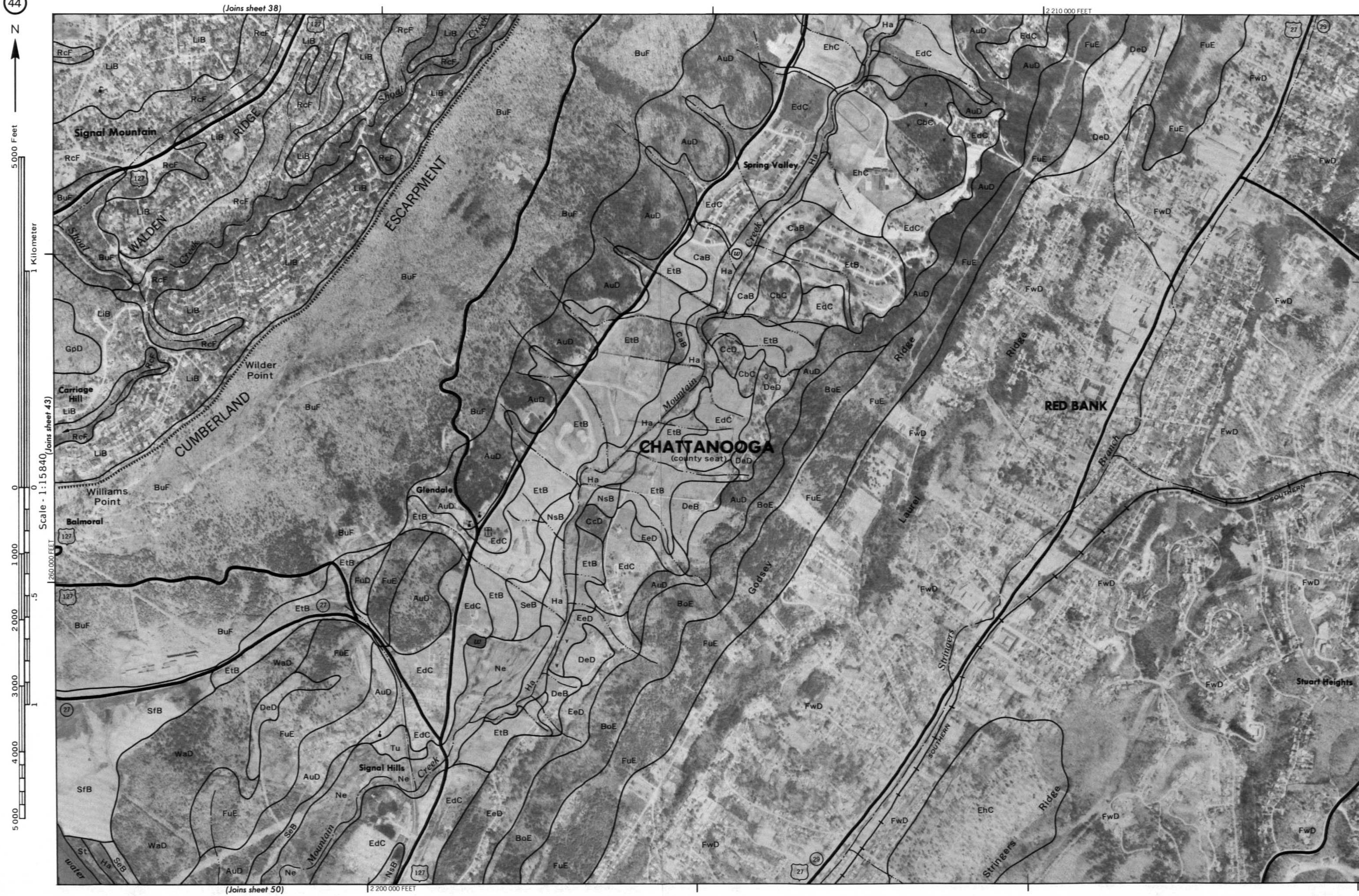
(Joins sheet 44)

N

5 000 Feet

1 Kilometer

Scale - 1:15840


44
N
(Joins sheet 38)
(Joins sheet 43)
(Joins sheet 45)
(Joins sheet 50)
2 210 000 FEET
2 200 000 FEET
265 000 FEET
260 000 FEET
Scale - 1:15840
5 000 Feet
1 Kilometer
Signal Mountain
WALDEN RIDGE
Shoal Creek
CUMBERLAND ESCARPMENT
Wilder Point
Carriage Hill
Williams Point
Balmoral
Glendale
Spring Valley
Mountain Creek
CHATTANOOGA
(county seat)
Signal Hills
RED BANK
Stuart Heights
Godsey Ridge
Laurel Ridge
Stringers Ridge
Stringers Branch
SOUTHERN
water

2 215 000 FEET

265 000 FEET

260 000 FEET

2 230 000 FEET

(Joins sheet 39)

(Joins sheet 44)

(Joins sheet 46)

(Joins sheet 51)

RED BANK

CHATTANOOGA
(county seat)

Forest Highlands

Manchester Park

Fairfax Heights

Lupton City

Dale Acres

Hamiltville

CHICKAMAUGA DAM

WILKES T THRASHER BRIDGE

TENNESSEE RIVER

CHICKAMAUGA LAKE

NICKAJACK LAKE

SOUTHERN

NORTH

CHICKAMAUGA CREEK

BIG RIDGE

FwD, Ur, CdC, CaB, EtB, CbC, SeB, DeB, TaC, Ne, water, CcD, FuE, MnB, DeD, FuD, FuB, BsD, BoE, RoB, ArB, Gu, Wo, WaB, Ha, St, Tu, Wh, SfB, WaD, TaD, BoD

N

5 000 Feet

1 Kilometer

Scale - 1:15840

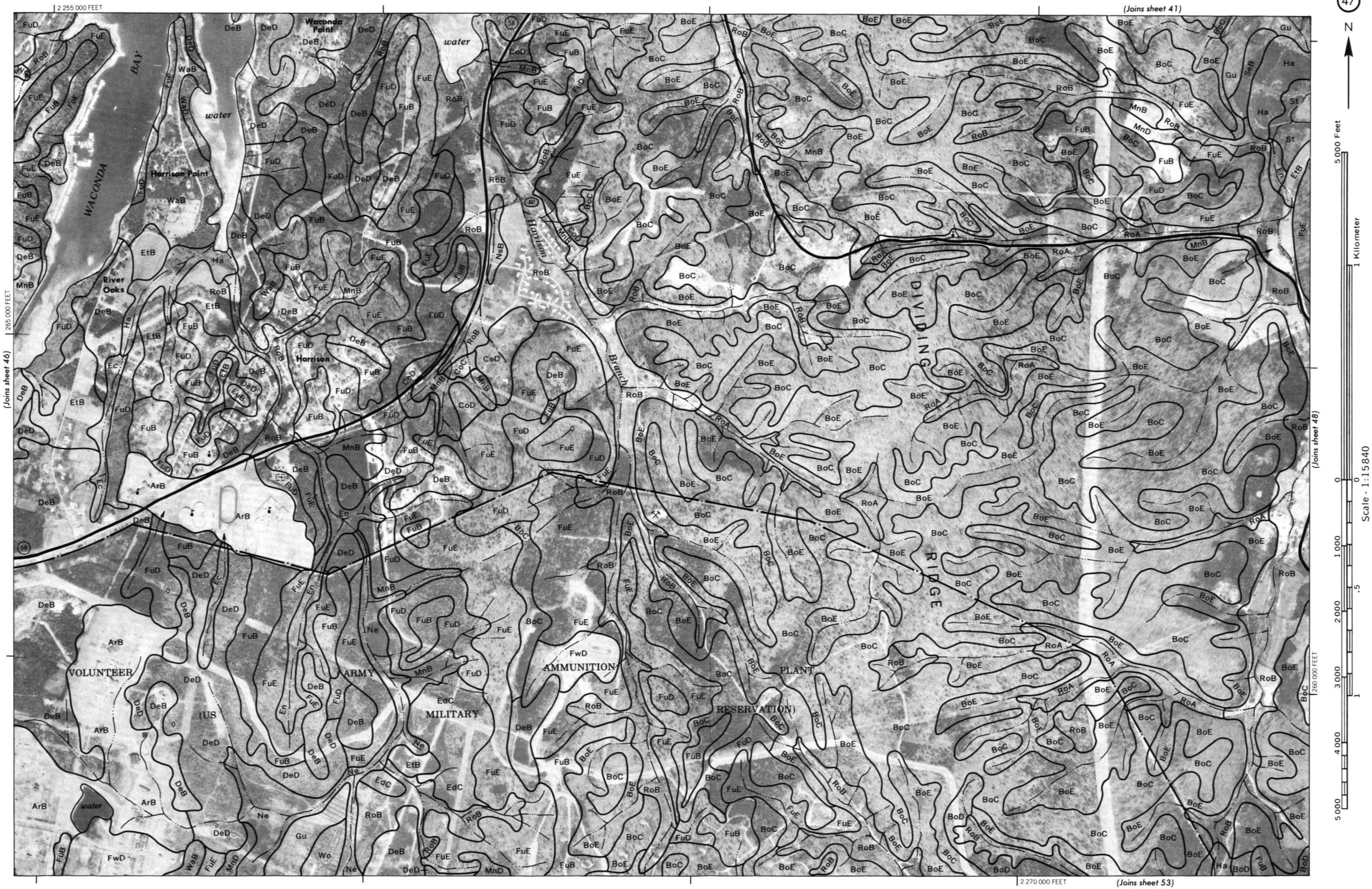
0 1 000 2 000 3 000 4 000 5 000

0 .5 1


N
5 000 Feet
1 Kilometer
Scale - 1:15 840
0
1000
2000
3000
4000
5000
0
.5
1
(Joins sheet 40)
(Joins sheet 45)
(Joins sheet 47)
(Joins sheet 52)
2 250 000 FEET
2 235 000 FEET
260 000 FEET
265 000 FEET
BIG RIDGE
TENNESSEE RIVER
CHICKAMAUGA LAKE
BOOKER T WASHINGTON STATE PARK
Northshore Estates
Murray Hills
CHATTANOOGA
(county seat)
VOLUNTEER ARMY
AMMUNITION PLANT
(US MILITARY RESERVATION)
water
58

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 47

47



48

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 48

2 189 000 FEET

295 000 FEET

(Joins sheet 37) 2 194 000 FEET

2 190 000 FEET (Joins sheet 43)

255 000 FEET

(Joins sheet 56) 2 195 000 FEET

49

N

5 000 Feet
1 Kilometer
Scale - 1:15840
0 1 000 2000 3000 4000 5 000
0 .5 1


50
N
(Joins sheet 44)
(Joins sheet 49)
(Joins sheet 51)
(Joins sheet 57)
2 215 000 FEET
2 200 000 FEET
255 000 FEET
245 000 FEET
Scale - 1:15 840
5 000 Feet
1 Kilometer
TENNESSEE
RIVER
NICKAJACK
LAKE
Burris Bar
Baylor Lake
Williams
Island
Lookout
Valley
Stringers
Branch
Stringers
Ridge
White Oak
Ridge
Stringers
Ridge
SOUTHERN
SOUTHERN
CHATTANOOGA
(county seat)
NORTH CHATTANOOGA
TENNESSEE
RIVER
NICKAJACK
LAKE
Maclellan Island
water
127
27
29


51
N
(Joins sheet 45)
(Joins sheet 50)
(Joins sheet 52)
(Joins sheet 58)
2 220 000 FEET
2 235 000 FEET
255 000 FEET
245 000 FEET
TENNESSEE RIVER
NICKAJACK LAKE
Crutchfield Bar
SOUTH CHICKAMAUGA CREEK
water
Lake Junior
EAST CHATTANOOGA
CHATTANOOGA
(county seat)
Missionary Ridge
GREENWOOD CEMETERY
Avondale
SOUTHERN
LOUISVILLE AND NASHVILLE
CHICKAMAUGA CR
5000 Feet
1 Kilometer
Scale - 1:15840
0
1000
2000
3000
4000
5000
.5
1

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 52

52

N

5 000 Feet

1 Kilometer

Scale - 1:15 840

(Joins sheet 51)

(Joins sheet 46)

2 250 000 FEET

255 000 FEET

(Joins sheet 53)

245 000 FEET

2 240 000 FEET

(Joins sheet 59)

VOLUNTEER army AMMUNITION PLANT

(US MILITARY RESERVATION)

CHATTANOOGA

(county seat)

Murray Hills

Lake Hills

Tyner

Poe Branch

Friar Branch

water

LOUISVILLE AND NASHVILLE SOUTHERN

MILITARY RESERVATION BOUNDARY

CHICKAMAUGA CREEK


53
N
(Joins sheet 47)
(Joins sheet 52)
(Joins sheet 54)
(Joins sheet 60)
2 255 000 FEET
225 000 FEET
2 270 000 FEET
215 000 FEET
VOLUNTEER ARMY AMMUNITION PLANT
(US MILITARY RESERVATION)
Knobs
Summit
Branch
Poe
Green
Shanty
Hollow
SOUTHERN
Silverdale
Summit
75
64
11
2A
1 Kilometer
5000 Feet
Scale - 1:15840


(Joins sheet 48)
2 290 000 FEET
255 000 FEET
245 000 FEET
2 275 000 FEET
(Joins sheet 61)
(Joins sheet 53)
(Joins sheet 55)
N
5 000 Feet
1 Kilometer
Scale - 1:15840
0
.5
1
1 000
2 000
3 000
4 000
5 000
MOUNTAIN
WHITEOAK
Dead Man Gap
Grindstone Mountain
Whiteoak Valley
Wolftever Creek
Little Wolftever Creek
Owl Hollow
Ooltewah
Wells
SOUTHERN
64
11
75

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 55

INSET A

INSET B (Joins sheet 31)

55

N

5,000 Feet

1 Kilometer

Scale - 1:15840

2 295 000 FEET (Joins inset, sheet 62)

255 000 FEET

(Joins sheet 54)

(Joins sheet 62)

2 300 000 FEET

245 000 FEET

2 294 000 FEET (Joins lower right)

283 000 FEET

(Joins sheet 42)

278 000 FEET

2 297 000 FEET

3000 AND 5000-FOOT GRID TICKS

2 295 000 FEET

295 000 FEET

(Joins sheet 36)

285 000 FEET

(Joins inset)

2 300 000 FEET

BRADLEY COUNTY

Little Wolftever Creek

Grindstone Mountain

Ridge

Middle Ridge

Long Savannah Ct.

MOUNTAIN

WHITE OAK

Mahan Gap

Smith

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 56

(Joins sheet 50)

(Joins sheet 56)

(Joins sheet 58)

(Joins sheet 65)

2 220 000 FEET

2 215 000 FEET

240 000 FEET

230 000 FEET

TENNESSEE RIVER

NICKAJACK LAKE

Cameron Hill

Moccasin Bend

Stringers Ridge

Tannery Flats

St Maclellan Island

Citico Bar

Citico Creek

CHATTANOOGA
(county seat)

NATIONAL CEMETERY

NATIONAL MILITARY PARK

Chattanooga Creek

Dobbs Brauch

Oak Grove

SOUTHERN

NASHVILLE

LOUISVILLE AND NASHVILLE

CENTRAL OF GEORGIA

AuE, ArB, BaE, BoE, CdC, EtB, FuB, FuE, FwD, Ha, SeB, SfB, St, Tu, Ur, Wh

N

Scale - 1:15840

5 000 Feet

1 Kilometer

58

N

5,000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 51)

(Joins sheet 57)

(Joins sheet 66)

(Joins sheet 59)

2 235 000 FEET

2 240 000 FEET

2 230 000 FEET

2 220 000 FEET

CHATTANOOGA
(county seat)

Avondale

Bushtown

Eastdale

Ridge

Glenwood

Highland Park

Missionary Ridge Tunnel

Ridgedale

Woodmore

BRAINERD

SOUTHERN

NASHVILLE

LOUISVILLE

AND

CHICKAMAUGA CREEK

SOUTH

SfB

CdC

FuE

FwD

FuB

FuD

SeB

Ha

RoB

MnB

EtB

ArB

St

WaB

Tu

CbC

CaB

water

TaC

Wh

Ne

59

N

2 240 000 FEET

240 000 FEET

(Joins sheet 52)

(Joins sheet 58)

(Joins sheet 60)

(Joins sheet 67)

2 255 000 FEET

235 000 FEET

CHATTANOOGA
(county seat)

CHATTANOOGA MUNICIPAL AIRPORT
(LOVELL FIELD)

Brainerd Hills

SOUTH Branch

Friar Branch

Pot Branch

CHICKAMAUGA CREEK

LOUISVILLE AND NASHVILLE

5 000 Feet

1 Kilometer

Scale - 1:15840


N
(Joins sheet 53)
(Joins sheet 59)
(Joins sheet 61)
(Joins sheet 68)
2 270 000 FEET
240 000 FEET
235 000 FEET
2 260 000 FEET
Silverdale
CHATTANOOGA
(county seat)
Standifer Gap
Huckleberry Pond
Branch
Mackey
water
5 000 Feet
1 Kilometer
Scale - 1:15840
0
1 000
2000
3000
4000
5000
.5
1

61

N

5 000 Feet

1 Kilometer

Scale - 1:15840

62

N

5 000 Feet

1 Kilometer

Scale - 1:15840

(Joins sheet 61)

(Joins sheet 55)

2 310 000 FEET

2 297 000 FEET

264 000 FEET

240 000 FEET

259 000 FEET

235 000 FEET

2 295 000 FEET

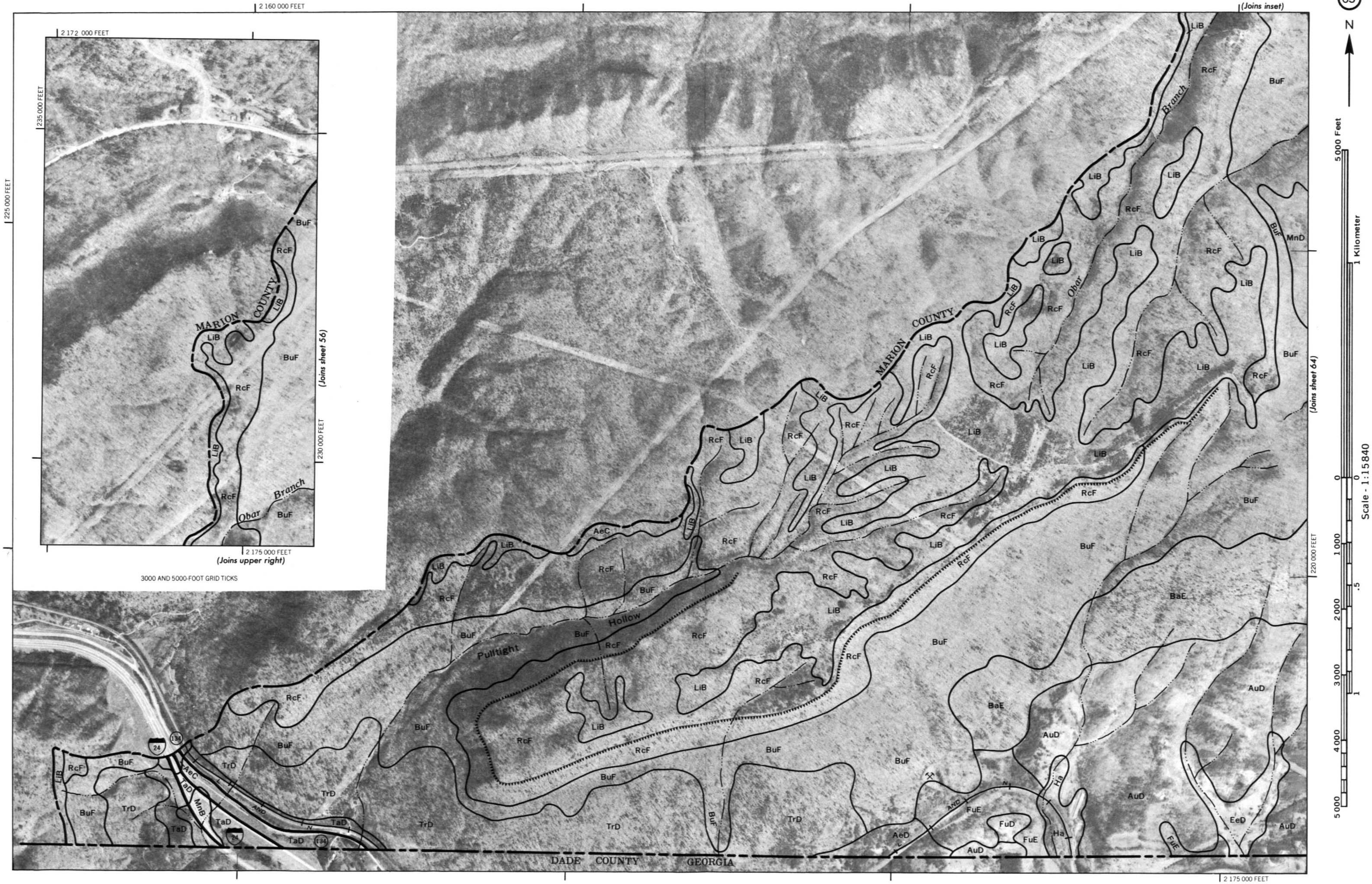
(Joins sheet 48)

(Joins sheet 55)

(Joins sheet 70)

2000 AND 5000-FOOT GRID TICKS

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 63



HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 64

64

N

(Joins sheet 56)

2 195 000 FEET

Tiftonia

CHICKAMAUGA AND CHATTANOOGA NATIONAL MILITARY PARK

Sunset Rock

Lookout Mountain

Wauchatchie

Black Creek

Valley Creek

Dry Branch

Ishill Branch

Lookout Mountain

CHICKAMAUGA AND CHATTANOOGA NATIONAL MILITARY PARK

DADE COUNTY GEORGIA

WALKER COUNTY GEORGIA

2 180 000 FEET

225 000 FEET

220 000 FEET

(Joins sheet 63)

(Joins sheet 65)

5,000 Feet

1 Kilometer

Scale - 1:15840

65

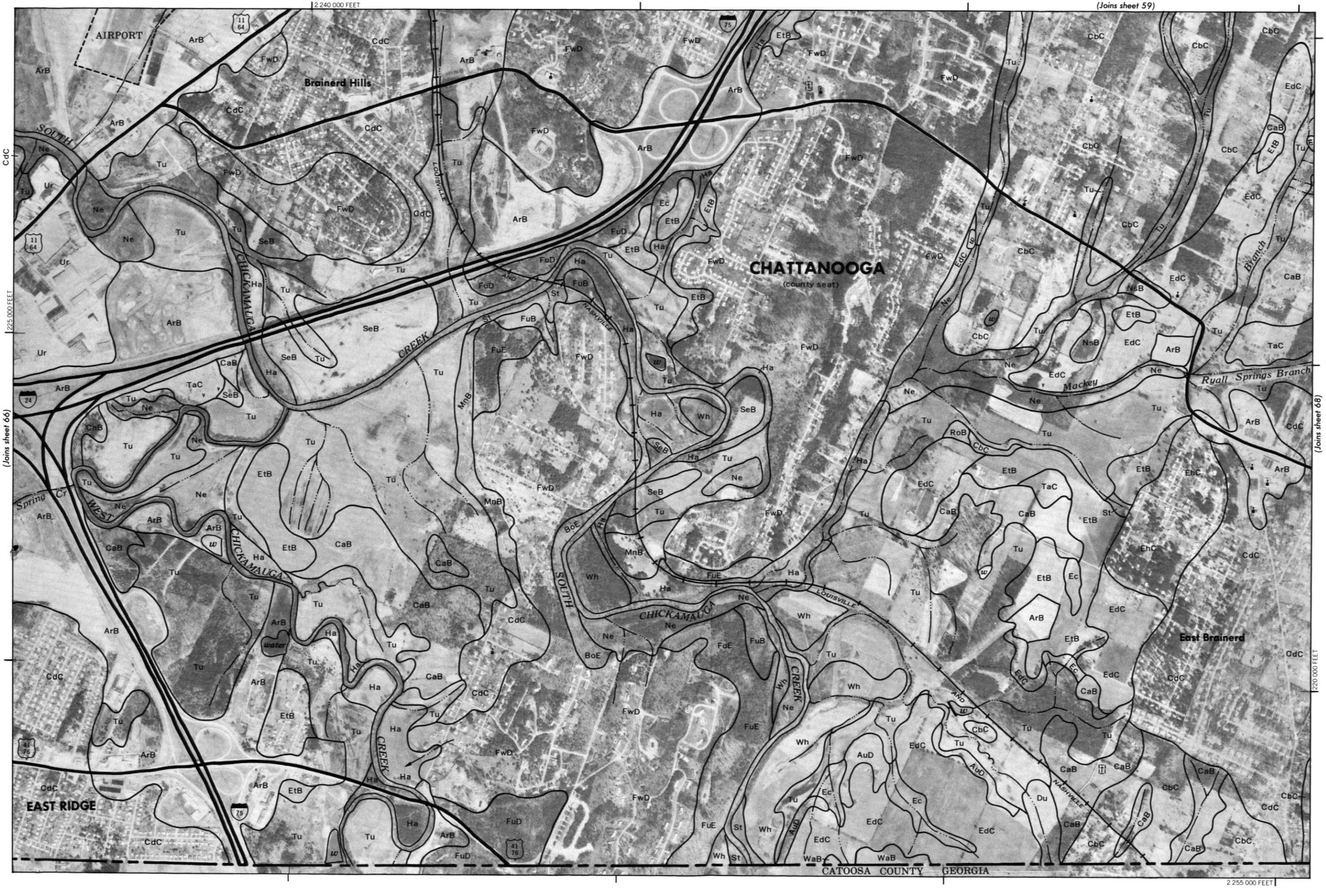
N

5,000 Feet

1 Kilometer

Scale - 1:15840


(Joins sheet 58)
2 235 000 FEET
CHATTANOOGA
(county seat)
BRAINERD
CHICKAMAUGA CR
EAST RIDGE
East Lake
Missionary Ridge
BACHMAN TUBES
Spring Creek
(Joins sheet 65)
(Joins sheet 67)
225 000 FEET
220 000 FEET
WALKER COUNTY GEORGIA
CATOOSA COUNTY GEORGIA
2 220 000 FEET
CdC
FuE
FwD
ArB
Tu
CcD
Ur
Ne
N
5000 Feet
1 Kilometer
Scale - 1:15840
0
1 000
2 000
3 000
4 000
5 000
.5
1


2 240 000 FEET
(Joins sheet 59)
AIRPORT
Brainerd Hills
CHATTANOOGA
(county seat)
East Brainerd
EAST RIDGE
SOUTH CHICKAMAUGA CREEK
WEST CHICKAMAUGA CREEK
Spring Cr
Mackey Branch
Ryall Springs Branch
LOUISVILLE AND NASHVILLE
CATOOSA COUNTY GEORGIA
225 000 FEET
220 000 FEET
2 255 000 FEET
(Joins sheet 66)
(Joins sheet 68)
67
N
5 000 Feet
1 Kilometer
Scale - 1:15840

HAMILTON COUNTY, TENNESSEE — SHEET NUMBER 68

(Joins sheet 61)

(Joins sheet 68)

(Joins sheet 70)

2 275 000 FEET

230 000 FEET

220 000 FEET

2 295 000 FEET

CATOOSA COUNTY GEORGIA

69

N

5 000 Feet

1 Kilometer

Scale - 1:15840


N
(Joins sheet 62)
(Joins sheet 69)
2 310 000 FEET
230 000 FEET
220 000 FEET
2 300 000 FEET
5 000 Feet
1 Kilometer
Scale - 1:15 840
0
1000
2000
3000
4000
5000
0
.5
1
Howardville
Ridge
Hill
Pine
Creek
Nicholson
Spring
Branch
Cat
Sugar
SOUTHERN
BRADLEY COUNTY
CATOOSA COUNTY GEORGIA
WHITFIELD COUNTY GEORGIA